

# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 707. (No. 28, Vol. XIV.)

JULY 13, 1922

[Weekly, Price 6d.  
Post free, 7d.]

## Flight,

The Aircraft Engineer and Airships

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2  
Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828

Annual Subscription Rates, Post Free:

United Kingdom .. 30s. 4d. Abroad .. 33s. 6d.\*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

\* European subscriptions must be remitted in British currency

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### DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

1922.

- Aug. 6-20 French Gliding Competition
- Aug. 6 .... Gordon-Bennett Balloon Race, Geneva
- Aug. 7 .... Aerial Derby Starting at Waddon
- Aug. 12 .... Schneider Cup Seaplane Race, at Naples
- Sept. .... Tyrrhenian Cup, Italy
- Sept. .... Italian Grand Prix
- Sept. or Oct. R.Ae.C. Race Meeting, at Waddon
- Sept. 22 .... Coupe Deutsch (300 kil.)
- Dec. 15-
- Jan. 2 Paris Aero Exhibition

1923.

- Dec. 1 .... Entries Close for French Aero Engine Competition

1924.

- Mar. 1 .... French Aero Engine Competition.
- Mar. 15 .... Entries close for Dutch Height Indicator Competition

### INDEX FOR VOL. XIII.

The Index for Vol. XIII of FLIGHT (January to December, 1921) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 1s. per copy (1s. 1d. post free).

## EDITORIAL COMMENT.



THE disinclination to face large issues calmly and on their merits that has been noticeable in England since the War is once again affecting the attitude of the country towards its comparative defencelessness in the air. There is, doubtless, general assent to the principle that the development of aircraft, civil and military, lighter and heavier than air, is of vital importance to our strategic safety as to our commercial prosperity. But this assent does not connote readiness to support, and still less to insist upon, the adoption of measures calculated to safeguard the interests admittedly involved. Rather is there a tendency, which was reflected on Friday in the House of Commons, to treat as mere "scares" attempts to prove how dangerously our air power has lapsed. Pious suggestions that nations should agree to suppress aerial locomotion altogether are put forward, despite their visionary character. Aviation is a fact that cannot be gainsaid. Its development in all countries is not merely a possibility, but a certainty. No nation can afford to handicap itself by deliberately or carelessly neglecting to exploit the quickest means of transport. Still less can any Power, great or small, run the risk of leaving itself at the mercy of the most deadly weapon of offence that the ingenuity of man has yet devised. Against the menace of this weapon there are but two means of protection. One is the possession of an adequate supply of efficient aircraft and efficient pilots; and the other is the strengthening of political safeguards, by the pursuit of sound policies, supported by international sanctions against wanton aerial offence.

The people of this country have not yet realised as fully as they ought the elementary fact that, strategically, Great Britain is no longer an island. Our southern shores, and even London, are technically open to bombardment by artillery from foreign territory. Slight though this danger may seem, it is increased a hundred-fold by the menace of foreign aerial bombardment. Hence the need for a consistent foreign policy that shall decrease, even if it cannot entirely remove, the danger of attack. Hence,

equally, the need for an adequate force of military aircraft supported by ample reserves of civil aircraft from which supplementary strength could, in an emergency, be drawn. At present this country is not only technically unprepared to meet an emergency, but it is mentally unprepared. Otherwise it would be unnecessary to repeat such self-evident propositions as those we have advanced. The supremacy in the air which this country enjoyed at the end of the War has vanished. The British aircraft industry is moribund, the designers of aircraft and of aircraft engines are being driven to close their works. Even Capt. Guest and the Air Ministry "do not regard the situation without a feeling of alarm." Yet nothing, or next to nothing, is being done to improve the situation or to build up an adequate military and civil nucleus for national air defence. This is no party or sectional question. The facts are not controvertible. The danger is national, and it must be met on a national basis. There is no true economy in the neglect of elementary provision for safety. The time has come when all parties and Departments of State and individuals of influence and authority should combine to find a path of safety and to lay down fixed lines of policy for the air. The condition of Europe is not such as to contain any pledge of prolonged tranquillity, and no nation can indefinitely rely upon its own defencelessness as a protection against mischance or ill-will. If provision be made, and if, side by side with the making of such provision, there be developed a sound and far-sighted policy of peace, the influence of this country in the affairs of Europe and of the world may gradually rise again from its present low estate. But a beginning has to be made, and that quickly.

Some who have read the above may think that, appearing in *FLIGHT*, it is a biased view of the position, but as it is word for word a leader from *The Times*, which appeared on July 10, that suggestion disappears. We reproduce it as we consider it is a masterly and very moderate summary of the present position in regard to the air.

#### Human Nature and Air Armament

With unfailing regularity the ideal of limiting air armaments as well as armies, navies, etc., is trotted out as an imperative necessity for the future welfare of civilisation. We agree that the ideal is ideal, but—here comes the crux of the whole thing—it is human nature you have to alter first if these enthusiasts are really to have their way. So long as humans are as they are, war must and will crop up from decade to decade, and it is only a question of when any particular section of this "civilised"—save the mark—world considers itself strong enough to attempt to break out through the boundary fence, for a new war to start.

In the case of battleships, the building of these can be restricted because you cannot construct these little items in a back yard. It is, however, a very different tale when you come to aircraft. Nothing in the world can really prevent thousands of aeroplanes from being built secretly at various points and ultimately assembled when the critical moment arrives for a blow to be struck. Even the finances involved are of such a relatively small amount that they are easily camouflaged under other headings.

Such being the undoubted position, it would indeed be a grave matter for any nation to sit still

under the false security of the other nation respecting its bond—or scrap of paper—agreeing not to create an air fleet. It would be a poor retaliation, when the enemy really got down to business, to chide him with "Oh, I say, you said you wouldn't build any of these beastly things, and now you've gone and done it! Oh, I say——"

No, it may be very Christian-like and desirable that restrictions in aircraft armament should be inaugurated, but it will not work, and the sooner these pious suggestions are completely negated the better. That the Empire, if it is to exist, *must* be prepared with an unconquerable air fleet is as certain as the coming of death and quarter-day. Therefore let the advocates for air supremacy continue their campaign for guiding public opinion into the right channels, so that when the time comes for a possibly aggressive nation to attack us, we may rest assured with the certain knowledge that we shall be over his capital before he has time to strike. Waiting on the ground within the shores of our little island for the coming of the aggressor's air fleet would be but poor comfort to our populace.

As to the absurdity of the argument that, after all, by the time the next war breaks out any aircraft built now would be obsolete, and that therefore it would be better to wait ten years or so before bothering—do these same ostriches imagine that we can afford to mark time until the next scrap starts before we begin to gain experience and to ponder on the best types to build? We have successfully, more or less, muddled through our other wars, but in the next one, with the menace from the air added, that is a little too much, even for the stolid Briton, to subscribe to.

When the next crash does come it will be swift and annihilating. It will not be a case of digging in whilst our forces are called together, trained and entrained: it will be a deadly assault on the peoples themselves in their sacred castles, their homes.

\* \* \*

#### The Air Navigation Order, 1922

The Order in Council just issued, and which came into force on July 11, follows, generally speaking, the lines of the Air Navigation Regulations of 1919. On certain points alterations have been made, chiefly to give effect to the provisions of the International Convention for Air Navigation, the commission of which is sitting in Paris at the moment. The new Order does not appear to call for much comment except in the matter of fees for licences. A minimum of £65 for an airworthiness certificate for a type aircraft appears to be unduly high. We appreciate that a good deal of work may be involved in going through the calculations, etc., for a new design, but surely it would be policy not to hamper development by imposing such heavy fees. We would suggest that these fees, or at any rate that for machines of less than 200 h.p., should be materially reduced, otherwise development of small sporting machines will be seriously handicapped. Could not the Civil Aviation Department do its share by making a considerable reduction on the fee? It is a magnificent department, but, frankly, it cannot at the moment have such a great deal of work to do, and the "stress-merchant" section might be kept from getting bored if discouragement were prevented by not, at any rate, imposing unnecessarily heavy fees on builders of small machines.

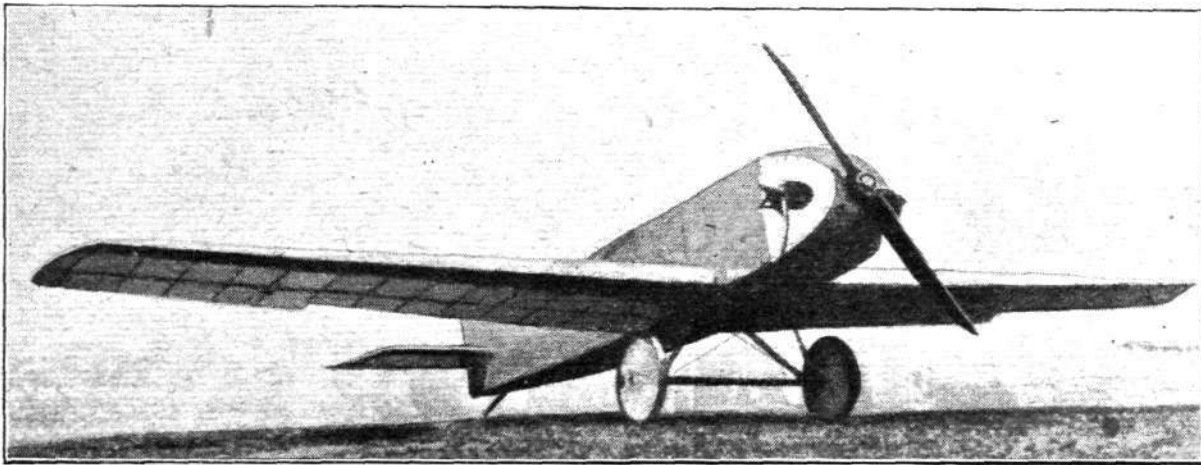


# THE UDET SPORTING SINGLE-SEATER

The Production of a Newcomer to the German Aircraft Industry

WHEN it was announced that, subject to certain limitations in engine power, Germany would become free to construct aircraft again, we expressed the opinion that probably the regulations would result in a considerable increase in the aerodynamical efficiency of German machines, and that quite a crop of new small machines would be produced. We have recently described several such, and this week we are in a position to give particulars of yet another small single-seater, this time produced by a firm which has but

of the wing, the machine would easily carry a passenger, with the same small engine. With regard to the structural strength of the wing, we are informed that the factor of safety is everywhere larger than 7; in the case of the front spar it is even stated to be over 10. The designers have worked to such high factors of safety that, even in the hands of comparatively inexperienced private owners, it would be difficult, not to say impossible, so to manœuvre the machine as to cause breakage in the air. *Ailerons* of



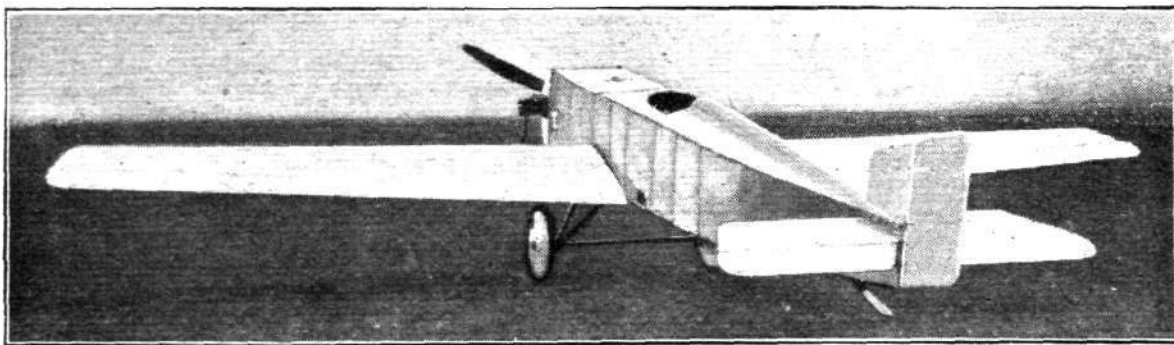
THE UDET SPORTING SINGLE-SEATER : Three-quarter front view.

recently been formed. The firm, which has its headquarters in Munich, is known as the Udet Aircraft Works, and was founded by Capt. D. Udet, who was a well-known German air-fighter during the War. Incidentally, the new Udet sporting monoplane is, as far as we are aware, the first post-War machine to be designed and built in Bavaria.

The Udet monoplane was designed by Capt. Udet's technical assistants, Hans Herrmann and A. R. Weyl, and is, as will be seen from the accompanying illustrations, of the cantilever type, with the wing placed low as in the Junkers machines. The machine is characterised by having wings of the, for a cantilever type, unusually high aspect ratio of about 9 to 1. Usually, a much lower ratio is employed for wings of this type in order to keep down the stresses. There is little doubt, however, that the higher aspect ratio results in a considerable improvement in efficiency, as well as in making the machine

large aspect ratio, although of small area, are hinged to the rear spar.

When in place on the machine, the wing spars rest in a recess in the bottom of the *fuselage*, the lower *longerons* of which are suitably strengthened to receive them, and are held in place by eight large bolts. It appears that to remove the wing from the machine it is necessary to remove the undercarriage, but as there is no bracing between the rear legs, and the struts are anchored by easily detachable ball-and-socket joints, the operation should not occupy many minutes. When removed, the wing is placed on special trestles above the *fuselage*, and the machine can, it is stated, be towed by placing the tail skid on the carrier of an ordinary motor-cycle. In fact, the machine was recently thus transported through the streets of Munich, much to the amusement of the passers-by.



THE UDET SPORTING SINGLE-SEATER : Three-quarter rear view.

a good deal nicer to handle, and from the fact that the weight empty of the whole machine is only 440 lbs., the wings cannot be excessively heavy.

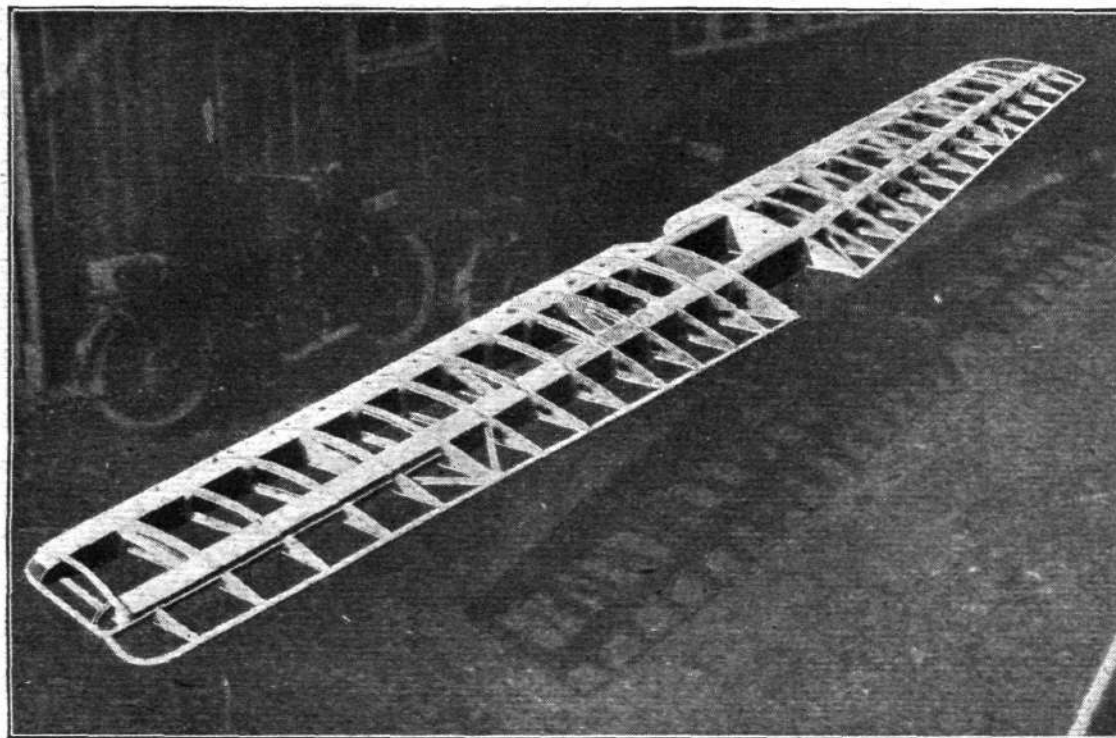
In the construction of the Udet monoplane wood has been largely employed, especially in the form of three-ply, with the exception of the engine mounting, controls and undercarriage. The wing is built up in one piece, of three-ply ribs, on two box spars having spruce flanges and three-ply sides. One of our photographs gives an idea of the general construction. The area of the wing is only 86 sq. ft., and as the weight of the machine, fully loaded, is 640 lbs., the wing loading is 7.44 lbs. per sq. ft. We have no information relating to the wing section used, nor to the landing speed of the machine, but it is stated that, owing to the good shape

The *fuselage*, which is of rectangular section with a slightly curved deck, is covered with three-ply, so that no wire bracing is employed. An exception is the front portion, which carries the 30 h.p. Haacke engine. This part of the *fuselage* is built up of steel tubes, and is so arranged that the whole engine can be moved a few inches in a fore-and-aft direction for purposes of trimming. As the weight of the engine is only about 140 lbs., however, it is hardly to be expected that a movement of a couple of inches can have any noticeable effect on the trim of the machine. The pilot's seat, it will be seen, is placed relatively far aft, in view of the light engine, and as a matter of fact we understand that in the next machine it will be moved farther forward. For the two-seater in contemplation, the present location will

be retained. The controls are of the usual type, and do not call for any comment.

The petrol tank is carried in the upper portion of the fuselage, behind the fireproof bulkhead, and it is claimed that sufficient head can be maintained for direct gravity petrol feed.

During recent test flights, the Udet monoplane, piloted by Capt. Udet, is stated to have behaved very well, although certain modifications are still necessary before putting it into production. When these have been effected the machine should appeal to many on account of its low running cost.



The Udet Sport- ing Single-seater: View of the wing in skeleton.

Normally, sufficient fuel is carried for  $2\frac{1}{2}$  hours' flight at full throttle, but if it is desired to make longer flights extra tanks can easily be fitted.

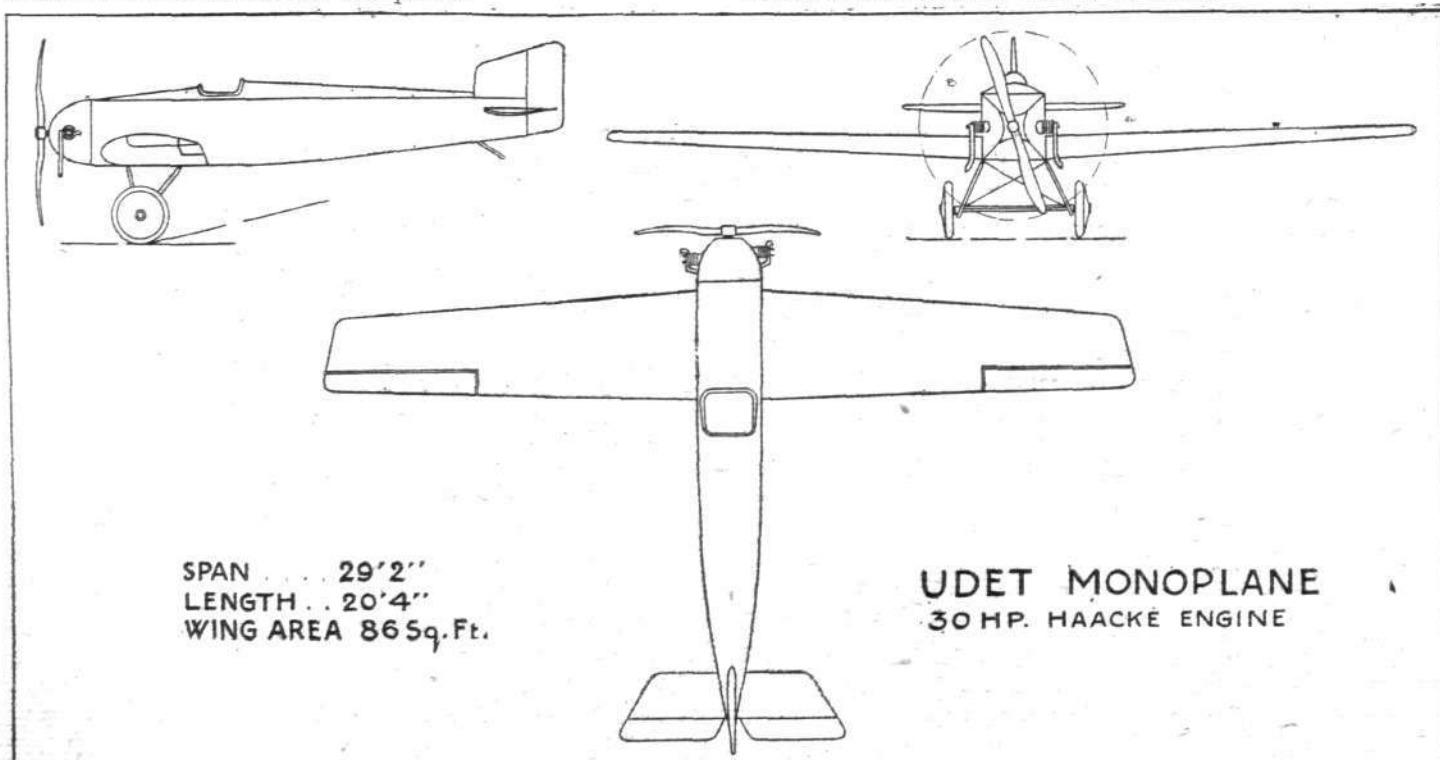
The undercarriage is of usual V-type, with struts of streamline steel tube, attached to the fuselage by ball-and-socket joints and having cross bracing in the front bay only. The wheel track is only 4 ft. 10 ins. A peculiarity of the design is the position of the undercarriage. From the side elevation it will be seen that the wheels are unusually far back, and one would imagine that the machine might have a tendency to stand on its nose. Probably, when the pilot's seat is shifted forward, the undercarriage will be moved forward also.

Beyond stating that they are of the cantilever type, the tail surfaces call for no comment, except to point out that the tail plane appears to be negatively cambered, as in some of the Pfalz machines of the War period.

It might be mentioned here that for many months now there has been in existence in this country a small monoplane on very similar lines to those of the Udet. This is a Bristol machine, with the fuselage of the Bristol "Babe," fitted with cantilever wings placed low on the body. This machine has one of the 60 le Rhone engines, but has not yet, we believe, been flown.

The main features of the Udet monoplane may be gathered from the following brief specification:—

Engine, 30-40 h.p. Haacke (2-cylinder opposed air-cooled); length, o.a., 20 ft. 4 ins.; span, 29 ft. 2 ins.; maximum chord, 4 ft.; minimum chord, 2 ft. 7 ins.; wing area, 86 sq. ft.; height, 5 ft. 7 ins.; weight of machine empty, 440 lbs.; weight fully loaded, 640 lbs.; power loading, 16 lbs./h.p.; wing loading, 7.44 lbs./sq. ft.; maximum speed, 180 kms. (110 miles) per hour; climb to 3,300 ft. in six minutes; duration with standard tanks,  $2\frac{1}{2}$  hours.



THE UDET SPORTING SINGLE-SEATER: General arrangement drawings.



# A BERLIN-VIENNA-ROME AIRSHIP PROPOSAL

AN important proposal has been placed by Commander F. L. M. Boothby, R.N. (retired), before the Air Ministry for running an experimental airship service between (a) London and Berlin, and subsequently (b) to Vienna, Rome, Constantinople and Russia. The details given by Commander Boothby are much on the conservative side, and the proposition bears with it such far reaching results that it is to be hoped the Government will give it the most favourable consideration, having regard to the very small, comparatively, financial risk which would be run, relatively to the possible advantages to be obtained imperially through its exploitation.

Here are the particulars of the proposals of Commander Boothby, and, incidentally, we may say that the German Government have offered to supply an airship of the Parseval type by way of an item in the reparation proposals for the destroyed Zeppelins.

1. A preliminary airship service to Berlin will be inaugurated, calling at Amsterdam, if the traffic warrants it, to obtain full data as to cost of running, etc.

2. An extension of the service to Vienna and Rome, the extra capital that the experience on the preliminary service shows to be necessary being obtained by the formation of a public company.

3. An extension of the service to Constantinople and Russia. It is proposed to utilise airships of about 31 tons displacement, with a useful lift of 18 tons, which will be disposed as follows:—Crew, 2 tons; passengers, 8 tons; mails, parcels, 2 tons; fuel, 3 tons; ballast, 3 tons.

The maximum horse-power will be 1,300.

An option to obtain the sole right of building Parseval airships in the British Empire has been obtained by me.

The directors and designers of both companies have been interviewed, and the question of obtaining the maximum degree of safety in commercial airships has been discussed. It is generally agreed that the following modifications to standard design can be made with advantage, and British insurance companies are prepared to quote lower rates if they are adopted.

1. The fuel can be removed from the keel and carried on the side of the ship in flexible tanks, which cannot overflow, and any fuel leaking will drop clear of all cars.

2. Use a fuel of a paraffin nature.

3. Place a layer of inert gas between the cars and the hydrogen.

4. Abolish all electric leads outside the cars, each car generating its own electricity supply.

It is also proposed to utilise hydrogen as fuel, and the necessary patents for the purpose can be obtained. This will considerably increase the efficiency of the airships, but full allowance is not made for this, pending actual tests of the system in commercial service.

A British firm of engine makers expect to be able to supply an engine that can be swivelled through 90 degrees. This, in conjunction with a reversible propeller will allow the ship to be driven up and down as well as ahead and astern, so providing the equivalent of 6,000 pounds of ballast, always available while the fuel lasts. This should considerably facilitate the handling of the ship in thick weather. It is hoped by the methods above indicated to make the airship a reasonably safe method of travel.

## Subsidy.

The continental airship service could be inaugurated if the Air Ministry were prepared to guarantee the same subsidy and facilities as are now granted to aeroplanes running on the London-Paris route for a number of years, making due allowance for the increased distance to be flown.

As in the case of aeroplanes, the Air Ministry would assist in the provision of the fleet.

A syndicate with a capital of £80,000 will be formed, who will erect mooring-masts near London and Berlin, and provide the running expenses of two airships for one year.

The Air Ministry will arrange for the supply of one 31-ton Parseval airship and one 31-ton Zeppelin airship of the Bodensee type instead of the 75-ton Zeppelin due for reparations. It has been ascertained that the German firms are quite willing to build these ships. British engines can be fitted if desired.

These two airships would then be run by the syndicate on the London-Berlin route, to ascertain which type is the more suitable for this work, and the actual cost of running, profits, etc. After a year's experience a company would be formed to extend the service to Vienna and Rome, the necessary airships of the selected type being built in England.

The Air Ministry to place Kingsnorth Airship Station at the disposal of the company for constructional and repair

work at a rent equivalent to 5 per cent. on the capital value of the station. The company would undertake to man the airship with men who would be available for service in case of war, and to hold all its ships at the disposal of the Government for war purposes. In return, the company would have the exclusive right of carrying mails by air to the countries served by it.

The appendix gives an estimate of the cost of the preliminary service, and also of the maximum profits which might possibly be made and of those that might be reasonably expected. No estimate is given as to the capital which would eventually be required, as this would depend on the result of the first year's working.

## Appendix

### Capital Expenditure.

	£
Two mooring masts at £15,000 .. ..	30,000
Motor transport .. ..	5,000
Hire of Kingsnorth .. ..	7,500
Offices, etc. .. ..	5,000
Working capital .. ..	32,500
<b>Total .. ..</b>	<b>80,000</b>

### Standing Charges.

	£
Insurance of ships at 10 per cent. .. ..	10,000
Depreciation of ships at £20,000 .. ..	20,000
Depreciation of masts at 10 per cent. .. ..	3,000
<b>Total .. ..</b>	<b>£33,000</b>

### Running Costs.

	£
Four crews at £10,000 .. ..	40,000
Petrol at 2s. per gallon, running 20 hours per day, 300 days at 1,000 h.p., using 4 lbs. per h.p. .. ..	34,285
Gas at 4s. per 1,000 cubic ft. to balance petrol plus 50 per cent. .. ..	10,286
Bases .. ..	25,000
Repairs, spares, etc. .. ..	20,000
Agents' fees and advertisements, etc. .. ..	10,000
<b>Total .. ..</b>	<b>£139,571</b>
Standing charges .. ..	£33,000
<b>Total running costs .. ..</b>	<b>£172,571</b>

### Revenue.

Assuming London to Berlin to be 2.5 times the distance of London-Paris, the subsidies payable would be as follows:—

Each passenger .. ..	£7 10s. 0d.
Parcels .. ..	7½d. per lb., or £70 per ton.

25 per cent. of gross takings.

The single fare is estimated at £10.

Possible profits, assuming a full load and 300 flying days.

	£
100 passengers per day for 30 days at £10 .. ..	300,000
Four tons of goods at 2s. per lb. .. ..	268,800
Subsidy on passengers .. ..	225,000
Subsidy on goods .. ..	84,000
25 per cent. gross takings .. ..	142,200
<b>Total .. ..</b>	<b>£1,020,000</b>
Running expenses .. ..	£172,571

Profit .. .. £847,429

Probable profits assuming 25 per cent. full load and 250 flying days.

	£
Passengers 25 per day at £10 .. ..	62,500
One ton of goods at 2s. per lb. for 250 days .. ..	56,800
Subsidy on passengers .. ..	46,875
Subsidy on goods .. ..	17,500
25 per cent. gross takings .. ..	29,625
<b>Total .. ..</b>	<b>£212,500</b>
Running costs .. ..	£172,571
<b>Profit .. ..</b>	<b>£39,929</b>

It is realised that there must be a limit to the amount of subsidy it is possible to earn. The estimate for possible profits is principally given to show that the airship service can run without assistance once a reasonably full load can be secured. Several years' running will probably be necessary to secure this, it being first necessary to prove that travel by airship is both safe and comfortable.

# A NEW CALTHROP PARACHUTE DEVELOPMENT

It would seem that the "slot" is destined to play an important part in the development of aeronautics. It was only just recently that Mr. Handley Page stirred us up with his slotted aerofoil, and now Mr. Calthrop comes forward with some more slots and accompanying improvements, but this time applied to the parachute. By this we do not mean that Mr. Calthrop has been applying the H.P. theory to his parachute, but that, as it happens, his new theory relating to parachutes embraces what is equivalent to a slot inserted in the parachute body.

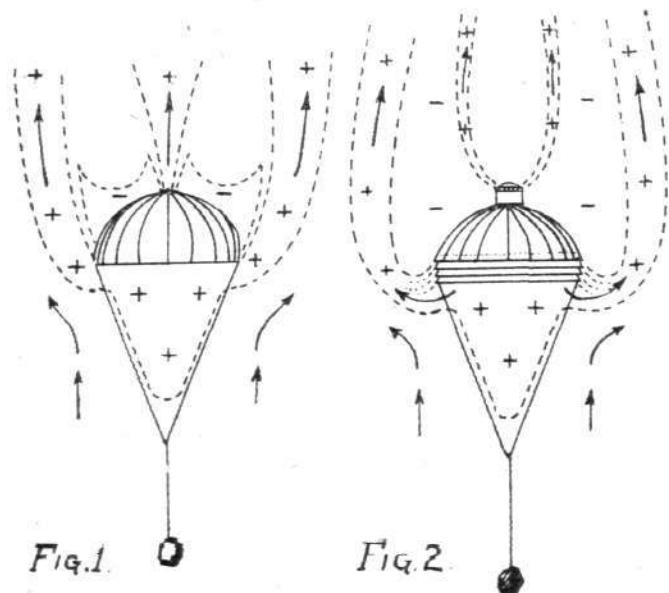
At present this new development has not got much beyond the theoretical stage, but a preliminary test with an actual

air results in the formation of a suction area, or a partial vacuum, immediately above the body of the parachute. The high pressure of air escaping through the vent in the apex of the parachute body, it may be mentioned, constitutes what may be termed a universal rudder preventing side-slip and generally stabilising the parachute.

The heavier the load on the parachute the more rapidly it descends with a corresponding increase in the diametral contraction of the parachute body by virtue of the pull of the load on the rigging. It is obvious that the more rapid the descent the greater will be the pressure of air within the body, but it has been found that contrary to what might be expected from the law of falling bodies, a parachute descends at a lower speed than is calculable in accordance with the area of the contracted diameter of the parachute. This may be explained by the fact that the compressed air escaping centrifugally and horizontally under the periphery of the parachute affords a tangible resistance to the uprising air current, virtually producing an extension, cantilever-wise, of the actual diameter of the parachute, and thus increasing the effective area of its resistance.

It may be assumed that the leading edge of the periphery of a parachute body forms an aerofoil set at a considerable angle of incidence to the path of the rising air currents, but with this peculiarity: The vertically rising air currents are diverted from their path shortly before reaching the leading edge, and to such an extent that the now highly compressed air flows past the leading edge horizontally at approximately right angles to it. Thus it will be seen that two conditions desirable in a parachute are, firstly, to extend and intensify the effects of the diversion of the vertically rising current of air projected outwards beneath the periphery of the parachute, and secondly, to utilise to its maximum of efficiency the effect of the highly compressed air escaping at the apex. It was with these objects mainly in view that this new Calthrop parachute was evolved.

In this parachute a series of circumferential apertures, or slots, are introduced in the body of the parachute, near the periphery. Over these slots, on the outside, are flounces so arranged—by means of separating webs—that they form a series of pockets, which deflect the air escaping through them at the desired downward angle. This latter depends upon the depth and position of the pockets. It should be mentioned that more or less than the three circumferential slots shown in Fig. 3—which is a diagram of the new parachute—may be used, and the higher their position the greater will be the pressure of the air ejected, but their effective resistance



**A NEW CALTHROP PARACHUTE:** Fig. 1. The air forces about an ordinary type parachute. Fig. 2. The same, but with the new type of parachute.

parachute was, with the assistance of the Royal Aero Club, carried out at Croydon on May 6 last with, we understand, encouraging results. It is hoped, however, that extensive practical tests will be made at an early date, and we are informed the Air Ministry has been approached with this object in view. For the time being, therefore, we do not

Fig. 3

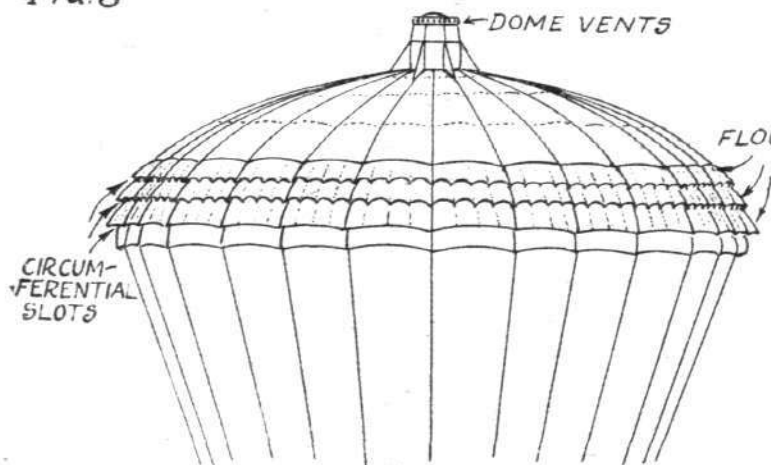
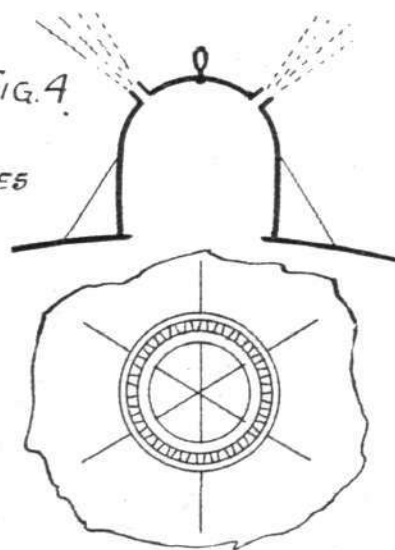


Fig. 4



**A New Calthrop Parachute:** Fig. 3. Diagrammatic sketch of the new type parachute, with three flounces. Fig. 4. Detail of the dome-shaped air vent at apex of parachute.

propose to do more than just briefly outline the theory of this parachute as explained to us by Mr. Calthrop.

At the outset we must acquaint our readers with the theory of the air forces in and about an ordinary parachute body during its descent, and to do this we think we cannot do better than quote from Mr. Calthrop's patent specification relating to his improved parachute. The behaviour of these air forces is shown in Fig. 1, which shows that during the descent of a parachute under load an inverted cone of compressed air continually accumulates under the parachute body, and that this air escapes partially through the vent in the apex of the parachute body and partially centrifugally under the periphery of the body. This escape of compressed

air results in the formation of a suction area, or a partial vacuum, immediately above the body of the parachute.

The introduction of these apertures, therefore, serves to produce the increased cantilever effect, previously referred to, of the compressed air escaping horizontally beneath the periphery of the parachute in resistance to the rising current of air, as indicated in Fig. 2.

It is also claimed that this results, in addition, in an extension of the area of partial vacuum on the upper surface of the parachute body, thus increasing the total lift.

In place of the usual circular vent hole in the apex of the parachute body, it will be seen from Figs. 3 and 4 that a cylindrical, dome-topped member is fitted. This is con-



structed of some suitable flexible material, and provided with external and internal stays, which together with the stiffness produced by the air pressure within, provide the necessary rigidity. In the upper portion of this member is an annular opening or vent, formed by two flanges, one on the domed top and one on the cylinder, separated by a zig-zag strip of stiff webbing. The area of this opening is less than that of the opening communicating with the interior of the parachute body, so that the cylindrical member is kept rigidly extended with the highly compressed air within. From the annular opening air escapes from the parachute in a highly compressed condition and in the form of a hollow cone of large superficial area. Thus greatly increased resistance surface against side-slip and a greater leverage to counteract oscillation of the parachute are produced.

Besides enabling a parachute of a given diameter to carry a greater load (or alternately, the same load to be carried by a parachute of smaller diameter), the new Calthrop parachute

has the additional advantage of considerably adding to the already quick positive opening characteristic of the well-known "Guardian Angel." A further important advantage is that, upon the parachutist landing, the "slots" permit the earlier escape of a portion of the compressed air within the parachute body during the period when the parachute exerts little or no pull (whilst it is falling from the vertical to the horizontal position). This prolongs the period of slack, giving the parachutist more time in which to effect his release.

We understand that two test parachutes of this type have already been built, each 28 ft. diam., one with three 8-in. annular flounces, and the other with three of 10 ins. It has been found possible to construct these flounces so that they not only cause the minimum of obstruction to the compressed air passing through them, but they do not in any way weaken the connection between the periphery and main portion of the body of the parachute. This is achieved by means of a special method of tape and webbing reinforcement.

## NOTICES TO AIRMEN

### "Air Navigation Order, 1922": Revised List of Prohibited Areas

1. AN Order in Council has been issued for the purpose of bringing the regulations governing air navigation in the British Isles into line with the provisions of the International Air Convention, which became operative on July 11, 1922.

This Order, entitled "The Air Navigation Order, 1922," which came into force on July 11, 1922, will have the effect of revoking, as from that date, the Air Navigation Regulations, 1919, and all Orders made by the Secretary of State amending these Regulations.

A revised edition of the Air Navigation Directions is in course of preparation, and will be published shortly.

2. Attention is specially drawn to the fact that in connection with the above-mentioned change the list of prohibited areas given in Schedule VI. of the Air Navigation Regulations, 1919, will be cancelled and substituted by the following list, as from 11th July, 1922:—

*Orkney Islands.*—An area enclosed by straight lines joining the following points: Tor Ness, Rora Head, Inga Ness, Mull Head, Old Head.

*Firth of Forth.*—An area enclosed by straight lines between the following places: Hill House (one mile south of Dunfermline), Blackness Pier, Dalmeny Church, Inchmickery, Hall-Craig Point.

*Osea Island.*—Three statute miles in all directions from the centre of Osea Island.

*Sheerness.*—Three statute miles from Garrison Point from 30° (true) to 190° (true), half a statute mile from Garrison Point from 190° (true) through west to 30° (true).

*Chatham.*—Three statute miles in all directions from Hoo Church.

*Portsmouth.*—Two statute miles from Dockyard Clock Tower from 180° (true) through west and north to 130° (true); one statute mile from Dockyard Clock Tower from 130° (true) to 180° (true).

*Poole Harbour.*—Three statute miles in all directions from Lytchett Minster Church.

*Portland.*—Two statute miles in all directions from Portland Castle.

*Devonport.*—Two statute miles in all directions from a point half a mile north of Stoke Church.

*Pembroke.*—Two statute miles in all directions from Wear Point.

*Cork Harbour.*—Two statute miles in all directions from Spike Island Fort.

3. Aircraft are forbidden to land in any of the above prohibited areas and to fly over any such area at a lower altitude than 6,000 ft.

4. Copies of the Air Navigation Order, 1922, can be obtained from H.M. Stationery Office, Imperial House, Kingsway, W.C. 2; 28, Abingdon Street, London, S.W. 1; 37, Peter Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 23, Forth Street, Edinburgh; E. Ponsonby, Ltd., 116, Grafton Street, Dublin; or through any bookseller. Price 11d.

5. *Cancellation.*—Notice to Airmen No. 8 of 1920 is cancelled. (No. 67 of 1922.)

### Commercial Aircraft: Carrying of Passengers in Seat next to Pilot

It is notified that passengers in commercial aircraft may not be carried in the seat beside the pilot. This prohibition does not apply to employés of the owner of the aircraft or to Air Ministry officials.

(No. 70 of 1922.)

## THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN JULY 2 AND JULY 8, INCLUSIVE

Route†	No. of flights*	No. of passengers	No. of flights carrying		No. of journeys completed†	Average flying time	Fastest time made by	Type and (in brackets) Number of each type flying
			Mails	Goods				
Croydon-Paris ...	38	137	17	26	36	h. m. 3 3	D.H. 34 G-EBBS (2h. 8m.)	B. (3), D.H. 9 (1), D.H. 18 (2), D.H. 34 (2), G. (9), H.P. (1), H.P. W.8B (3), Sp. (2).
Paris-Croydon ...	38	115	10	26	33	2 43	D.H. 34 G-EBBR (1h. 53m.)	B. (5), D.H. 18 (2), D.H. 34 (2), G. (8), H.P. W.8B (3), Sp. (2).
Croydon-Brussels ...	6	9	3	6	6	2 33	Westland G-EARE (2h. 8m.)	D.H. 18 (1), D.H. 34 (1), W. (1).
Brussels-Croydon ...	6	8	—	4	5	3 2	Westland G-EARE (2h. 16m.)	D.H. 18 (1), D.H. 34 (1), W. (1).
Croydon-Rotterdam-Amsterdam.	9	7	9	8	9	2 26§	Fokker H-NABS (1h. 59m.)	F. (5).
Amsterdam-Rotterdam-Croydon.	9	10	9	9	9	3 28§	Fokker H-NABS (2h. 27m.)	F. (7).
Totals for week ...	106	286	48	79	98			

\* Not including "private" flights.

† Including certain diverted journeys.

‡ Including certain journeys when stops were made en route.

§ Rotterdam.

*Incidental Flying.*—Capt. Stocken and Mr. Hayns returned to Croydon from Brussels on 3rd, and later tested an Avro and Bristol Fighter for the Aircraft Disposal Co. The De Havilland Co.'s D.H. 9 made six return trips between Lympe and Ostend during the week.

# THE CASE FOR THE SLOTTED WING\*

By R. REYNOLDS

IN future design, more attention should be given to the speed range of the machine, either by having a lower landing speed or by having the same landing speed with a higher top speed. Amongst the many proposals that have been made for an increase of this ratio, the slotted plane device is by far the most promising, but its application needs great care, and in the succeeding article a comparison is made of the results which can be obtained by its successful application with the adverse effects which will be present if great care is not exercised in the design. For this purpose the section known as RAF/6 (see Fig. 3) has been chosen as a basis. Below is the calculated performance of a machine fitted

$K_y$  is given for top speed and landing speed, slot open and closed.

$$K_y = \frac{1}{\sqrt{K_y}} \cdot \frac{K_x}{K_y^{3/2}} \cdot \frac{60}{88} \sqrt{\frac{W}{A} \frac{g}{\rho}} \cdot \frac{W}{550} \sqrt{\frac{W}{A} \frac{g}{\rho}}$$

0.133 2.74 0.538 44.3 472  
0.580 1.31 (max  $K_y$  unslotted)  
0.943 1.03 (max  $K_y$  slotted)

Allowing 75 per cent. of the available horse-power.

$$\therefore \frac{K_x}{K_y^{3/2}} = \frac{320 \times 0.75}{472} = 0.51$$

From the curve for 10 lbs. of loading, when  $\frac{K_x}{K_y^{3/2}} = 0.51$ ,

$$\frac{1}{\sqrt{K_y}} = 2.68 \text{ (see Fig. 1).}$$

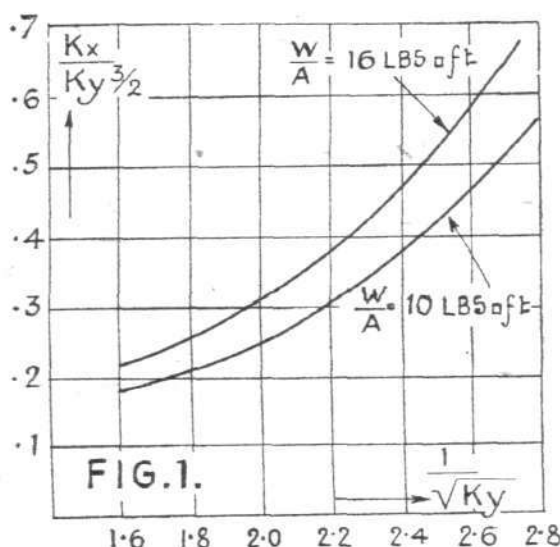
$$2.68 \times 44.3 = 119 \text{ m.p.h. top speed.}$$

Landing speed will be:—

$$1.31 \times 44.3 = 58 \text{ m.p.h. unslotted}$$

$$\text{and } 1.03 \times 44.3 = 46 \text{ m.p.h. slotted.}$$

To still retain the same landing speed as the basic section,



with this section. With slot closed practically all the advantages of the basic section are obtained. Results are taken from those published in a paper read before the Royal Aeronautical Society by Mr. Handley Page, Fellow, on the Slotted Wing, in their journal of June 21, 1921. The calculations are based on:—

$$(1) V/\text{m.p.h.} = \frac{60}{88} \sqrt{\frac{W}{A} \frac{g}{\rho}} \cdot \frac{1}{\sqrt{K_y}} \quad V - \text{Velocity in miles per hour.}$$

$$(2) \text{H.P.} = \frac{W}{550} \sqrt{\frac{W}{A} \frac{g}{\rho}} \cdot \frac{K_x}{K_y^{3/2}} \quad W - \text{Weight in lbs.}$$

$$\text{where } \frac{1}{\sqrt{K_y}} = \frac{V}{\frac{60}{88} \sqrt{\frac{W}{A} \frac{g}{\rho}}} \quad A - \text{Area in sq. ft.}$$

$$\text{and } \frac{K_x}{K_y^{3/2}} = \frac{\text{H.P.}}{\frac{W}{550} \sqrt{\frac{W}{A} \frac{g}{\rho}}} \quad g = 32.2.$$

$$\rho - \text{density of the air in lbs. per cubic ft.}$$

so that by plotting the usual  $K_y$  and  $K_x$  curves in the form  $\frac{1}{\sqrt{K_y}}$  and  $\frac{K_x}{K_y^{3/2}}$  it is equivalent to plotting horse-power required against the corresponding velocity.  $\frac{60}{88} \sqrt{\frac{W}{A} \frac{g}{\rho}}$

is a constant which, when multiplied by  $\frac{1}{\sqrt{K_y}}$ , gives velocity in miles per hour, and  $\frac{W}{550} \sqrt{\frac{W}{A} \frac{g}{\rho}}$  when multiplied by  $\frac{K_x}{K_y^{3/2}}$  gives horse-power required.

Data for an aeroplane from which the calculations are made are as follows:—

Weight	..	..	..	4,000 lbs.
Area	..	..	..	400 sq. ft.
Loading	..	..	..	10 lbs./sq. ft.
Horse-power	..	..	..	320
Wt./h.p.	..	..	..	12.5 lbs.

\* This article by Mr. Reynolds of the Handley Page experimental staff appeared some time ago in the German journal *Zeitschrift für Flugtechnik und Motorluftschiffahrt*. In the English version we have retained the usual English units.

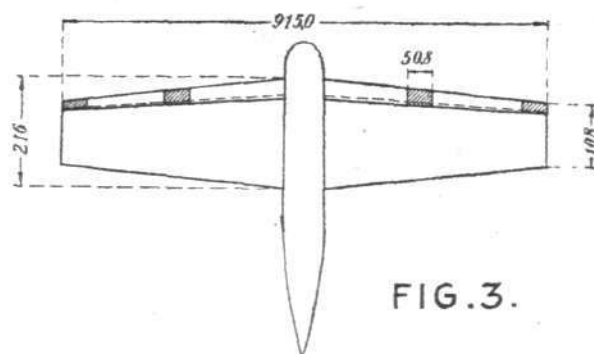


FIG. 3.

58 m.p.h., and increase the top speed, the loading is increased and the area diminished.

$$\text{From the equation } V = \frac{60}{88} \sqrt{\frac{W}{A} \frac{g}{\rho}} \cdot \frac{1}{\sqrt{K_y}}$$

$$\frac{W}{A} = \left( \frac{88}{60} V \sqrt{\frac{K_y}{g/\rho}} \right)^2$$

where  $K_y$  maximum for the slotted wing is 0.943.

The new loading becomes 16.1 lbs. with an area of  $\frac{4,000}{16.1}$  lbs. = 248 sq. ft.

$$\frac{60}{88} \sqrt{\frac{W}{A} \frac{g}{\rho}} = 56.3$$

$$\text{and } \frac{W}{550} \sqrt{\frac{W}{A} \frac{g}{\rho}} = 600$$

$$\therefore \frac{K_x}{K_y^{3/2}} = \frac{320 \times 0.75}{600} = 0.4$$

From the curve for 16.1 lbs. loading, when  $\frac{K_x}{K_y^{3/2}} = 0.4$

$$\frac{1}{\sqrt{K_y}} = 2.24 \text{ (see Fig. 1).}$$

$$\therefore \text{New top speed will be } 2.24 \times 56.3 = 126 \text{ m.p.h.}$$

$$\text{and landing speed } 1.03 \times 56.3 = 58 \text{ m.p.h.}$$

For top speed the slot must be properly closed, otherwise a diminution in  $\frac{K_y}{K_x}$  results.

To obtain these results it is necessary to know conditions essential for high maximum  $K_y$ :—

(a) Aerofoils near enough for mutual interaction.

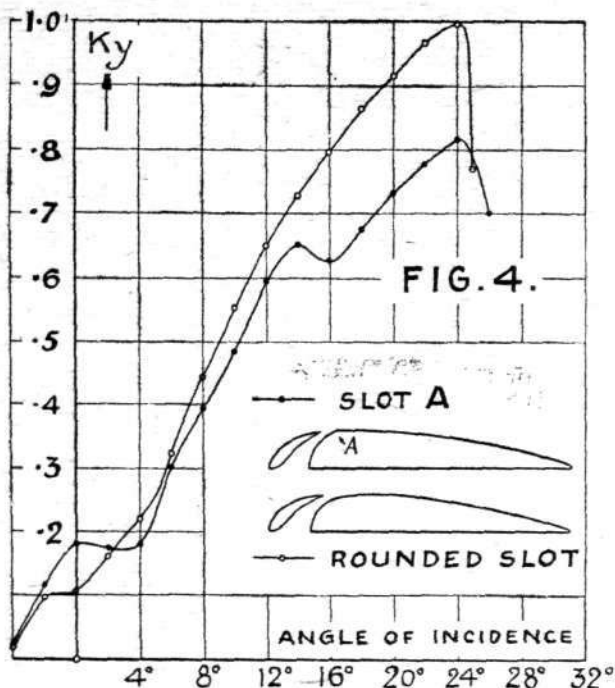
(b) Slot of proper dimensions to allow perfect flow of air.

(a) The auxiliary aerofoil should have the same top surface as the nose of the basic section. The under-side should be deeply cambered. The position in front of the main



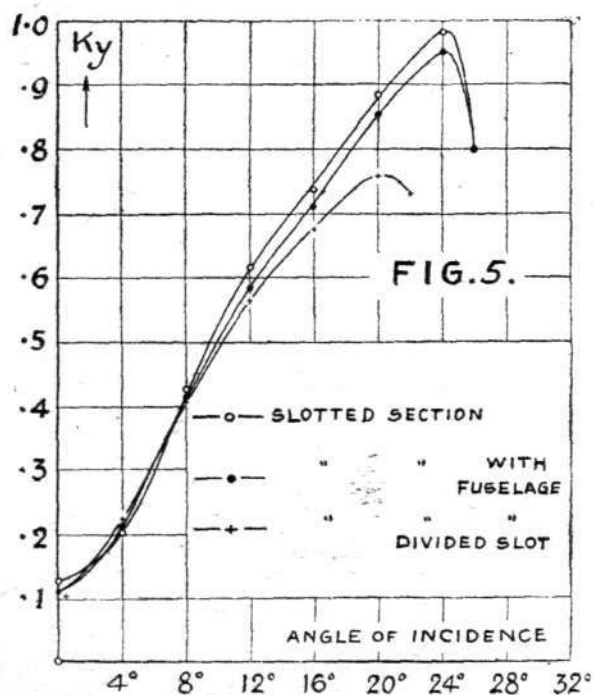
aerofoil should be such as to give the auxiliary aerofoil a negative incidence to the main air flow.

(b) To obtain proper slot formation the nose of the main



aerofoil should be of small radius and come in at right angles to the base line.

The auxiliary aerofoil having a deep under-camber and the nose of the main aerofoil being sharply rounded, will



give a gradually converging slot, the ratio between the entry and exit being, roughly, 4 to 1.

Results very different in character have, however, been obtained by W. Von Klemperer and published in the *Zeitschrift für Flugtechnik und Motorluftschiffahrt*.

### The Burney Airship Scheme

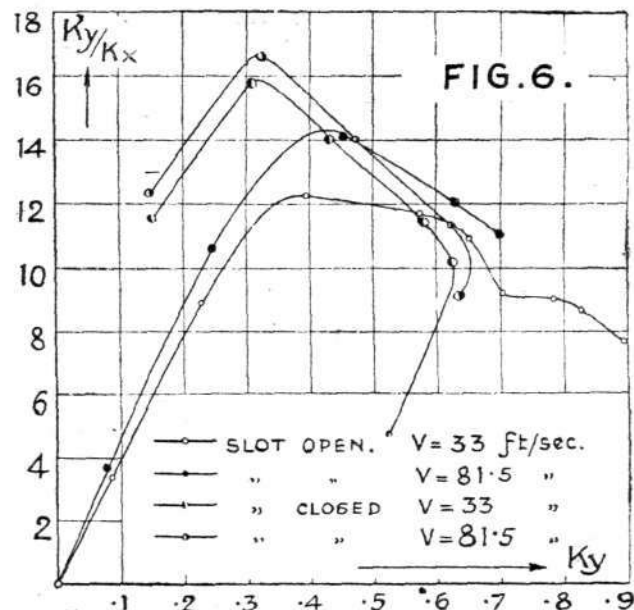
THE Air Ministry announces that the statement which has appeared in the Press to the effect that the Admiralty and Air Ministry are in disagreement as to the Burney Airship Scheme is wholly incorrect. The Air Ministry has expressed itself favourably to the technical aspects of the scheme, subject to certain reservations, and the Admiralty have stated the great interest which they take in the development of airships which would be available for use in naval operations. So far from conflicting, the view of both departments is that the preservation of airships would be of considerable value to both of them for aerial and naval purposes. But the main

It will be seen on reference to his diagrams (Fig. 2) that a comparison with the essential qualities required for a slot will show that many of the essential features have been neglected, with the result that the slotted plane is, as designed by him, very inefficient.

Herr Klemperer in his tests split the slots by having outriggers for support of the auxiliary plane of such dimensions as to interrupt the flow through the slots. This will cause burbling. It will be seen that where the outriggers occur the plane is a low-lift section and at the slots a high-lift one. This causes an uneven flow over the whole surface, with the results mentioned.

Tests shown will illustrate this slot interruption (see Figs. 3 and 5). His slot section should have been wider in the centre than at the tip with a taper plane. The gap or point of exit for the air should decrease in the same ratio.

By having the nose of the main aerofoil cutting into the



top surface at a sharp angle, it will cause eddying behind this point, and consequently a reduction in maximum  $K_y$ . This is clearly illustrated in Fig. 4.

Leaving the unslotted portion in the centre of the plane is not the same as having a body in position; this again causes burbling at a most critical point of the aerofoil. It will be seen that the body  $K_y$  is practically negligible compared with the unslotted portion. These tests are shown in Figs. 3 and 5, and will show no big difference in  $K_y$  with and without fuselage.

Although the maximum  $\frac{K_y}{K_x}$  is diminished by the slot at lower angles, at bigger values of  $K_y$  it is better than with slot closed. Owing to V.L. effect this is more difficult to compare, but at higher air speeds the maximum  $\frac{K_y}{K_x}$  shows a better improvement with slot open than slot closed. Fig. 6 will show this.

Taking into consideration the slight increase in weight for slot attachment, the advantage of reducing the landing speed 20 per cent. or increasing top speed and still retaining the same landing speed are great, inasmuch as they greatly reduce the running costs, both in insurance and actual flying time.

The writer's thanks are due to Messrs. Handley Page, Ltd., for permission to publish the details of the tests given above, which were carried out in their Research Department.

problem arises in connection with the cost of retaining and developing airships which, even under the Burney scheme, involves a very large expenditure of public money, and this problem is one which can only be decided by the Government as a whole.

### The French Gliding Competition

THERE can now be little doubt that the French Gliding Competition to be held at Clermont-Ferrand from August 6 to 20 will be a great success, at any rate from the point of view of entries. No less than 40 machines have been entered, and probably a few more will be booked before the closing date, July 15.

# LONDON TERMINAL AERODROME

Monday evening, July 10, 1922.

BUSINESS is now showing signs of becoming brisker. The number of passengers travelling by air is increasing slowly, and had it not been for unfavourable weather this week's returns would have shown a substantial advance.

The Daimler Airway are steadily making headway, and their passenger lists are increasing in a very encouraging manner; while Handley Page Transport are, of course, still obtaining high average loads. Their passenger car arrives at the aerodrome regularly with a full load, and on Sunday last it was necessary to send two "W.8b's." in order to accommodate the number of people who, despite the wind, wished to travel to Paris by Handley Page.

The Royal Meteorological Society held their annual summer meeting at the air-station on Wednesday last. There was quite a large gathering, and, despite the fact that they had been unable to provide themselves with good weather, the Fellows showed a keen interest in every feature of the aerodrome, meteorological and otherwise. Mr. G. R. Hay, the meteorologist in charge at the air-station, read a paper on meteorology in commercial aviation, after which it was arranged that the visitors should divide into three parties, one of which was to have tea, while the others toured the aerodrome, and went up in the Surrey Flying Services' Avro for joy-rides. Owing to the weather—it was pouring with rain—it was decided that the aerodrome inspection and the joy-riding should be washed out, and this was suggested after Mr. Hay had read his paper. To the amazement of the organisers, however, practically the entire assembly voted in favour of the joy-rides, despite the rain, and Mr. Muir and Mr. Yuell between them took some 68 of the visitors, both men and women, up into the pouring rain. Perhaps they wished to see for themselves "where the rain was coming from," with a view to extending their knowledge of weather phenomena.

## The Irish Free State Air Force

A PILOT of the Irish Free State Army—Lieut. MacSwiney, left, on Wednesday morning, for Dublin, piloting a Bristol fighter, which the Aircraft Disposal Co. have erected for the Irish Free State. I understand that there is also an Avro erected for the same destination, and there are rumours of 16 other Bristol fighters being ordered by the Irish Free State. These machines have a new international registration mark—concentric circles of green, white, and orange, the green on the outside and the orange in the centre.

The gale that blew up on Wednesday night disorganised the entire traffic on the airways, and various machines which were *en route* when it began were forced to land and abandon their journeys for the day, although some managed to complete their flights before the worst of the weather arrived. Two "Goliaths," one belonging to the Messageries Aériennes, and the other to the Grands Express, alighted at Penshurst, and, as there is no shed large enough to accommodate them there, they had to be picketed out through the gale. At 3.30 a.m., on Thursday morning, the automatic wind-gauge on the aerodrome registered a terrific gust of 65 m.p.h., and it was, undoubtedly, this squall that caused the majority of the damage done during the night. The large sign on the roof of the H. P. offices was blown down and smashed to pieces, although there was one section of it still in its place undamaged.

## Fine Flying in the Gale

ON Thursday morning, the gale had not blown itself out. In fact, the wind-gauge was still registering gusts as high as 50 m.p.h. But, in spite of this, Mr. Robbins arrived on a "D.H.18" from an overnight forced-landing in Kent, while Mr. Geysendorfer, on one of the Fokker monoplanes, left for Amsterdam shortly after 8 a.m. He made a sensational take-off, one wing being thrown up by a gust just as he had left the ground, and a lull in the wind dropping him to within a few feet of the ground a few seconds later. Apparently, however, he was quite comfortable about it all, and landed at Rotterdam less than two hours afterwards. Another K.L.M. monoplane, which left Rotterdam shortly after 2 o'clock, was 6 hrs. 40 mins. before it arrived at Croydon, landing at

Lympne on the way for more petrol. These two machines were the only ones that completed their journeys from terminus to terminus during the day—a very creditable performance.

Mr. Robertson, flying the Daimler "D.H.34 G-EBBS," left Paris as late as 7 p.m., on Wednesday evening, with four passengers, three of whom were women, and, after trying to get across the Channel no fewer than six times, had to descend at St. Inglevert owing to approaching darkness. He left again on Thursday morning, and, crossing the Channel at 3,000 ft., arrived at Croydon in 1 hr. 18 mins. The official report from Lympne put the wind at 3,000 ft. at 58 m.p.h., and Mr. Robertson said that the gusts amounted to at least 70 m.p.h.

Amongst the passengers who have travelled from the air-station by air this week, was Colonel Robert Loraine, who flew to Paris by the Instone Line. He met several old friends on the aerodrome, and was, I understand, returning from Paris by Handley Page. Another passenger who is famous in his own sphere was Mr. H. F. V. Edwards, the running champion, who was, on Saturday, running in a race at the Croydon sports, held just across Plough Lane from the aerodrome. After competing there, he crossed the road and embarked in the Instone Air Liner for Paris, where he was, I understand, to run in a race on Sunday.

## Experiments in Sound-Ranging

EXTENSIONS are being made to the control tower. The top has been taken off, and a new portion is to be built above it. This is, I am told, to accommodate a sound-ranging device which is to be used for experiments in locating the position of an aeroplane in the clouds, or in mist, which renders it invisible from the aerodrome. The idea was mooted and talked about last year, and is now to be put to practical tests, with a view to improving the system of guiding machines into the aerodrome in thick weather.

The De Havilland Aircraft Co. are now running a daily early-morning service from Lympne to Ostend. Lympne has been chosen in order to get over the difficulty of the early morning mists, which hang over the hills just outside Croydon, and often prevent machines from starting. Newspapers are the primary load for this service, but on the return journey passengers will be carried at a fare of £3. This idea was first mooted as far back as 1920, but, owing to the fact that it meant diverting machines from the ordinary services, and keeping them more or less idle at Lympne for the greater part of the day, or, alternatively, flying them backwards and forwards between Lympne and Croydon empty, nothing came of it. I understand that the De Havilland Co. are stationing mechanics at Lympne.

The Daimler Airway have now received one of their damaged "D.H.34's" back from Stag Lane, and this will make things easier for the hard-working "G-EBBS," although this machine shows no sign of being a bit the worse for the past strenuous six weeks. The new engine repair-shops, and the engine-testing plant for this firm, are now practically completed, and are to be officially opened in the course of the next few days. On Sunday, the Handley Page air-line carried as many as 39 passengers.

The "D.H.18 G-EARO," one of the airway veterans, which was handed back on Monday to the Air Ministry, by the Instone Air Line, has, it is calculated, flown a distance of 90,000 miles between London and Paris.

A movement has been set on foot to form a club for pilots and managers on the aerodrome, and a meeting was held recently in the pilots' room of Handley Page Transport—kindly lent by that firm for the occasion. Capt. Baker, the C.A.T.O., was in the chair, and Commander Perrin, of the Aero Club, was in attendance to give the benefit of his experience in such matters. It was decided to form a club, with the title of "The London Terminal Aerodrome Club." It was also agreed that negotiations should be opened with the Air Ministry for the renting of suitable premises. A Committee of seven was appointed, comprising Messrs. Baker, Perrin, Shaw, Foot, Leverton, Robertson and Powell.

## The Breguet "Leviathan" Flies

THE all-metal Breguet "Leviathan," the fuselage of which was exhibited at the last Paris Aero Show and described and illustrated in our issue of November 24, 1921, has been flown. Piloted by M. Thierry, the machine first made a straight climb to 1,000 ft., and the pilot then made a complete circuit of the Villacoublay aerodrome. No sharp turns were

attempted, as the machine is a large one, and it was thought wiser to proceed slowly with the tests. The "Leviathan," on which the late Lieut. Henry Roget was to have attempted a flight from Dakar to Pernambuco, is fitted with one of the Breguet-Bugatti quadruple engines, in which two groups of double vertical engines drive a common tractor screw *via* automatic clutches.



## INTERNATIONAL COMMISSION FOR AIR NAVIGATION

THE International Commission for Air Navigation held its first meeting in Paris on July 11. This meeting was convened by the French Government, in accordance with the terms of the International Convention for the Regulation of Aerial Navigation, which came into force on July 11.

Fourteen States ratified the Convention on June 1, these being:—Belgium, Bolivia, British Empire (including Canada, Australia, New Zealand, South Africa and India), France, Greece, Japan, Portugal, Serb-Croate-Slovene State, and Siam, while the following States, which were not signatories to it originally, have adhered:—Persia, Peru, Liberia, and Nicaragua.

The Right Hon. the Lord Gorell, C.B.E., M.C., Under-Secretary of State for Air, attended the meeting as the British representative, and acted also as the representative of India, and the Dominions, with the possible exception of Canada, who has not yet notified her representative. He was accompanied by Major-General Sir W. Sefton Brancker, K.C.B., A.F.C., Colonel L. F. Blandy, D.S.O., Controller of Communications, and other officials of the Air Ministry.

Sir W. Sefton Brancker, after this first meeting, is the permanent representative of Great Britain, and also for the present of the Dominions, with the possible exception mentioned above.

The duties of the Commission are laid down in the Convention (Chapter VIII, Article 34) as follows:—

- (a) To receive proposals from or to make proposals to any of the Contracting States for the modification or amendment of the provisions of the present Convention and to notify changes adopted.
- (b) To carry out the duties imposed upon it by the present article and by Articles 9, 13, 14, 15, 16, 27, 28, 36 and 37 of the present Convention.
- (c) To amend the provisions of the Annexes A-G.
- (d) To collect and communicate to the contracting States information of every kind concerning International air navigation.
- (e) To collect and communicate to the contracting States all information relating to wireless telegraphy, meteorology, and medical science which may be of interest to air navigation.
- (f) To ensure the publication of maps for air navigation in accordance with the provisions of Annex F.
- (g) To give its opinion on questions which the States may submit for examination.

The Commission, at this meeting, considered (a) various questions provided in the Convention; (b) certain matters referred to it by the Aeronautical Commission of the Peace Conference and the Conference of Ambassadors; and (c) questions referred by signatory States.

Before the Commission assembled, a meeting of the Anglo-Franco-Belgian Civil Aviation Conference took place in Paris.

## THE AIR NAVIGATION ORDER, 1922

THE Air Navigation Order, 1922, which came into force on July 11, is in general similar to the existing regulations, which were issued on April 30, 1919 (and published in *FLIGHT* of May 8, 1919). The differences in detail are in the main those necessary to give effect to the provisions of the International Convention for Air Navigation. A few alterations not directly attributable to the Convention appear, however, to have been incorporated, among which mention may be made of the following: (a) From January 1, 1923, certificates of airworthiness will be required for *all* aircraft, and not merely for those employed in public transport: the daily maintenance certificate, however, is still only required in the case of aircraft falling in the latter category; (b) After November 1, 1922, all British aircraft must be equipped with certain specified instruments (the nature of which has not yet been announced); (c) the fees for certificates and licences have been revised.

With regard to (c), the registration fee for an aircraft is fixed at one guinea, and for the renewal of the registration certificate at 5s. The charges for airworthiness certificates for *type* aircraft, are as follows: When the nominal horsepower does not exceed 200, the fee is £65; from 200 to 400 h.p., £90; from 400 to 600 h.p., £110; and above 600 h.p., £126. These fees are, of course, for machines of new type.

The fee chargeable on the issue of airworthiness certificates for subsequent aircraft of the same type, or for the renewal of any airworthiness certificate, is £5 5s. In cases where machines resemble a type for which a certificate has already been issued, the Secretary of State for Air has power to reduce the fees if the resemblance is sufficient materially to reduce the work of testing and examination.

In the case of aerodromes, the fee for issue of a licence is as follows: Up to 25 miles, from the nearest R.A.F. aerodrome, £1 1s.; from 25 to 50 miles, £2 2s.; more than 50 miles, £3 3s. The fee for a renewal is in all cases, £1 1s.

For the issue of licences, etc., to personnel, the following fees are charged: For pilots, Navigators and Engineers, medical examination, £1 1s.; for pilot's flying tests, £1 1s.; for all technical examinations, 5s.; and for all licences, 5s. The renewal fees are the same, except the medical examination, which is reduced to 10s. 6d.

As the new regulations are, in the main, similar to those published in full in our issue of May 8, 1919, we do not propose to publish the text of the Air Navigation Order of 1922. All interested should make a point of obtaining from H.M. Stationery Office, Kingsway, a copy of the Order. The title is: *Statutory Rules and Orders, No. 663 of 1922*, and the price is 11d. net.

### ROYAL AERONAUTICAL SOCIETY NOTICES



**Chairman.**—At a Council Meeting held on June 28, Prof. Leonard Bairstow, C.B.E., F.R.S., Fellow, was elected Chairman of the Society for the year 1922-1923 in succession to Lt.-Col. M. O'Gorman, C.B., Fellow, whose period of office terminates on September 30 next.

**Election of Members.**—The following members were elected at a Council Meeting held on June 28:—

**Associate Fellow:** J. E. Dumbleton, A.M.Inst.C.E.

**Members:** Brian L. Martin, B.Sc., Air Vice-Marshal Sir Geoffrey H. Salmond, K.C.M.G., C.B., D.S.O.

**Library.**—The following books have been received and placed in the Society's Library:—"Fuel for Motor Transport" (Second Memorandum), The Fuel Research Board; "A Short Course in Elementary Meteorology," by W. H. Pick; "Report of the International Allied Commission of Control" (Germany), Air Ministry; "Proceedings of the Second Air Conference held on February 7 and 8, 1922"; "All the World's Aircraft, 1922"; "A Dictionary of Applied Physics," edited by Sir Richard Glazebrook; "Rapports Premier Congres International, Paris, 1921"; "Aviation in Peace and War," by Sir Frederick Sykes; "Application de la Resistance des Matériaux au calcul des Avions," by M. Boileve; "The War in the Air," by Sir Walter Raleigh; "14,000 Miles Through the Air," Sir Ross Smith.

W. LOCKWOOD MARSH,

Secretary

### Splendid Flight by French Aviators

ONE THOUSAND MILES non-stop in an ordinary two-seater aeroplane is a very good performance, especially when nearly 500 miles is over the sea. Yet this is the achievement of M. Pelletier d'Oisy and his engineer, Corpl. Bussard. The machine used was a Breguet 14 A 2, with 300 h.p. Renault engine, and it carried 1,150 litres (about 250 galls.) of petrol, which naturally made it somewhat heavy during the first part of the flight. Leaving Tunis at 6 a.m. on July 6, M. Pelletier d'Oisy headed out to sea and shaped a course for Sardinia. Having made a "landfall" here, he proceeded along the coast until Corsica was picked up. From Ajaccio a course was shaped for St. Raphael, and it might be mentioned that most of the flight across the Mediterranean was made at the low altitude of 800 metres (2,600 ft.). After leaving St.-Raphael M. Pelletier d'Oisy climbed to 3,000 metres (10,000 ft.), heading towards Lyon. Here low clouds were encountered, and the aviators had to resort to "contour-chasing" in order not to get lost in the clouds. The wind was terrific, and to make matters worse, rain and hailstorms were encountered. When about 150 km. from Paris the propeller was beginning to suffer severely from the hailstones, and a landing was made. After waiting for about 10 minutes the weather moderated somewhat and the flight was resumed, the two gallant aviators landing at Le Bourget at 5.50 p.m., having covered the 1,000 miles in just under 12 hours, or at an average speed of 83 m.p.h. On this flight M. Pelletier carried official dispatches only, but the flight does give an excellent demonstration of what will be done in the future in the way of mail-carrying by aircraft.

# IN PARLIAMENT

## Aviation (Helicopter)

LIEUT.-COMMANDER KENWORTHY on June 30 asked the Secretary of State for Air what progress has been made in the experiments on the heli-coptic system of flight; and whether the reward for any successful invention on this system is still offered by the Department?

Captain Guest: The answer to the first question is that satisfactory progress is being made with the experiments; to the second, that it is still intended to offer a prize for a successful helicopter, but that it has been necessary to settle points of detail in connection with the conditions of the competition. I hope, however, that a formal announcement will be made before very long.

## Aerial Defence

VISCOUNT CURZON on July 3 asked the Prime Minister whether the Committee to inquire into certain matters relating to the relations between the Royal Air Force and the Royal Navy, presided over by the Minister of Education, have as yet held any meetings, and when a Report may be expected; and if the Report will be published?

The Prime Minister: No formal meeting of the Committee has yet been held, but some progress has been made by preliminary exchange of views. I am unable to say when the Committee will conclude its labours. A Report will be rendered to the Committee of Imperial Defence, of which this is a Sub-Committee. It is unusual to publish reports of Sub-Committees of the Committee of Imperial Defence.

Lieut.-Commander Kenworthy asked the Prime Minister how long the special Sub-Committee of the Committee of Imperial Defence, which was formed to consider the problem of air defence and development, has been in existence?

The Prime Minister: The Sub-Committee was appointed on October 31 last. It has already reported, and its Report is to be considered by the main Committee very shortly.

## The Jupiter Engine

SIR EDMUND BARTLEY-DENNISS on July 4 asked the Secretary of State for Air whether he is prepared, in the interests of the Royal Air Force, to take any, and what, steps to prevent the disbandment of the staff and the disuse of the plant of the Bristol Aeroplane Company used in the manufacture of the air-cooled aeroplane engine known as the Jupiter?

Mr. Parker (for Capt. Guest): No type of aero engine can be ordered in quantity for the Royal Air Force until its suitability for service requirements and its superiority to any other engine of the same type have been clearly demonstrated. At the moment, therefore, my right hon. friend is not prepared to place production orders for the Jupiter engine. The Air Ministry is awaiting quotations from the Bristol Aeroplane Company for the manufacture of a few engines of a modified and developed experimental type. Those orders, if placed, should materially assist in the retention of a nucleus staff capable of further expansion if necessary.

## R.A.F. Establishment and Equipment

CAPT. VISCOUNT CURZON on July 6 asked the Secretary of State for Air whether his attention has been drawn to the statement issued by the Rolls-Royce firm that unless more orders can be given to them for the construction of aircraft engines they will have to close down that branch of their business; whether he is aware that many other firms engaged in the manufacture of aircraft and air engines are in a similar position; whether the Air Ministry intend to do anything to prevent such a state of affairs; whether he has any information to show how long the aircraft industry as a whole can exist on the present basis in this country; and whether these matters are receiving, or will receive forthwith, the attention of the Committee of Imperial Defence?

Capt. Guest: My attention has been drawn to the statement mentioned by my noble friend, and I am sorry to say that there are a number of firms in the aircraft industry whose orders for aircraft are far below the production capacity of their works. Owing to the necessity for national economy, drastic reductions were effected this year in Air Estimates. Consequently, money is not at present available to permit of large orders for aircraft being placed by the Air Ministry. I cannot give any forecast of the kind asked for by the noble lord, but I appreciate the seriousness of the position in the industry, and I can assure him that it is engaging the anxious consideration of the Air Council. As regards the last part of the question, the national capacity to produce an adequate supply of aircraft and engines in war time is an important aspect of the problem of national air defence, which is already under consideration by the Committee of Imperial Defence.

Viscount Curzon: Does not the right hon. gentleman think that a most serious position may shortly arise if this and many other firms in the country are compelled to close down or go out of business altogether, and are the Air Ministry prepared to look upon this and do nothing whatever to help these firms?

Capt. Guest: I can assure my noble friend that we do not regard this situation except with a feeling of grave alarm, and we have made it our duty to represent this strongly to the Government.

Viscount Curzon asked what percentage of the total Vote for Air Services is expended upon the actual provision of machines, repairs and personnel, respectively; how many pilots and observers are on the active list and actually operating today; and what is the total strength of other officers and men on the establishment of the Royal Air Force?

Capt. Guest: In regard to the first question, I assume that my noble and gallant friend desires some information which is not contained in the Air Estimates, but I am not clear what precisely it is. The main provision for Air Force pay will be found under Vote 1 of the Air Estimates, and the cost of the maintenance of air personnel under Vote 2. The money expended upon the provision of aeroplanes and their equipment is shown under Votes 3 and 9. Provision for repairs is partly included under the latter votes, but repairs are also undertaken, to a large extent, by service personnel, and it would, therefore, be difficult to disentangle the cost of such repairs from the personnel votes. The answer to the second question is that, according to the latest returns available, there are 1,862 qualified pilots and 109 observers. As regards the last question, there are 958 non-flying officers. This figure is partly made up of ex-warrant officers and other specialist experts who came to the Royal Air Force during the War, and whom it has been necessary, for various reasons, to retain temporarily. This number, therefore, will in the future constantly decrease, and will be reduced by about 200 within the next few months. Thereafter it will decrease steadily until it shrinks to a total of 530, which constitutes the present establishment of the non-flying list. The number of other ranks is 25,887.

## Cost of Squadrons

MR. E. HARMSWORTH asked the Secretary of State for Air whether his attention has been drawn to a statement by Lord Weir that a French squadron

costs but a quarter of what it costs to maintain a British squadron; what are the causes which bring it about; and what steps he proposes to take?

Capt. Guest: I have seen the statement referred to, but I do not know on what basis Lord Weir's estimate was framed. In any case, I think that deductions from published figures of air expenditure in the two countries must be subjected to so many qualifications as to render the comparison illusory. I may point out, for example, that French personnel are provided by compulsory service, and that British Air Estimates include expenditure of a kind which the French meet under Army and Navy Votes. The French Air Service is almost entirely concentrated at home, which enables a greater part of the training to be done with the unit than is the case with us. Further, owing to the French mechanic being conscripted, it is possible to give less training to skilled personnel than is necessary in the British Service, where we have to teach them their trade.

## Air Power

MAJ.-GEN. SEELY asked the Prime Minister what definite steps His Majesty's Government propose to take in order to safeguard our air position and to secure the adequate and equal consideration of the needs of all three Services?

The Prime Minister: A Sub-Committee of the Committee of Imperial Defence has completed an enquiry into this question, and its report has been under examination by the full Committee. Before the Government takes its final decision, I should be glad if a deputation of four Members of the Parliamentary Air Committee could attend a meeting of the Committee of Imperial Defence and lay its views before that body.

## Extradition by Aeroplane

LIEUT.-COL. POWNALL asked the Home Secretary whether he has considered the possibility where extradition from a country situated like Austria involves crossing one or more other States with the consequent extradition difficulties of arranging for the prisoner to be brought by aeroplane?

Mr. Shortt: I am afraid the difficulties involved by the plan proposed by the hon. and gallant member would be more formidable than those which may arise when an extradition prisoner is taken through the territory of a third State in the ordinary course. There is no need to anticipate any serious difficulty arising in the present case if the usual methods are followed.

## Naval Aircraft Carriers

VISCOUNT CURZON asked the Parliamentary Secretary to the Admiralty how many aircraft carriers are now in commission and in reserve; how many ships are fitted for carrying aircraft; and whether enough machines, pilots and observers are kept either on board or at their attached aerodromes to provide for the full establishment of aircraft laid down for these ships?

Mr. Amery: The ships in commission are *Argus* and *Pegasus*; the ships under construction or reconstruction are *Hermes*, *Eagle* and *Furious*; *Ark Royal* is in reserve. Seventeen battleships, four batt'e cruisers and seven light cruisers are fitted with flying platforms. As regards the number of machines, I would refer my noble and gallant friend to the reply given on April 12 to the hon. and gallant member for Hertford (Rear-Admiral Sueter). The number of pilots and observers is adequate for the aircraft actually allocated to the Navy.

Viscount Curzon: Is the answer to the second part of my question in the affirmative or in the negative?

Mr. Amery: I referred to an answer in which I said that the number we thought desirable had been reduced from considerations of economy.

Viscount Curzon: Are we to understand that the Navy has not got the number of machines that it really requires; and, further, are the Admiralty satisfied with the position? May I have an answer?

Mr. Speaker: It was contained in the last answer.

Viscount Curzon: On a point of order. I asked the right hon. gentleman whether the Admiralty are satisfied with the position. That was not contained in the answer.

Mr. Speaker: I think it was.

## Inter-State Air Services and Australia

MR. ALFRED T. DAVIES asked the Secretary of State for War whether his attention has been directed to the statement of the Commonwealth Minister of Defence, that delay in the manufacture of aeroplanes in England is preventing the start of important inter-State air services in Australia in August and September next; and whether the Ministry has taken, or intends taking, any action to remove this delay?

Capt. Guest: I have been asked to reply. Although I have seen the reports in the Press of the statement referred to, I have received no other intimation that such a delay is taking place. Whatever may be the cause of the delay, there does not appear to be any justification for interference or action by the Air Ministry.

## Helicoptics

LIEUT.-COMDR. KENWORTHY asked the Secretary of State for Air whether he can make any further statement with regard to the experiments on the heli-coptic system of flight; and whether orders for new machines for the Royal Air Force are being held over pending the results of the experiments?

Capt. Guest: I am not in a position to add to the statement made in answer to the hon. and gallant member on June 30. No orders for new machines for the Royal Air Force are being held up pending the results of these experiments.

## R.A.F. Pilots and Officers

MR. MALONE, on July 7, asked the Secretary of State for Air how many trained airship pilots and how many other officers and men trained in any particular branch of airship work are now available; and how are they employed?

Capt. Guest: The numbers are: Trained airship pilots, 56; other officers, trained in airship duties (engines, stores, wireless), 21; airmen, trained in airship duties, 135. A few of the officers were also aeroplane pilots, and are now serving as such; the remainder are employed on various Royal Air Force duties or are undergoing courses of instruction. Of the airmen, 83 were riggers, and these are now under training as riggers of aeroplanes or balloons; the remaining 52 were hydrogen workers, and are being trained for other Royal Air Force duties, chiefly as mechanical transport drivers.



# THE ROYAL AIR FORCE

London Gazette, June 30, 1922

## Promotions

The follg. officers are promoted to the ranks stated, with effect from June 30:—

## General Duties Branch

*Air Comdr. to be Air Vice-Marshal.*—O. Swann, C.B., C.B.E.  
*Group Capt. to be Air Comdr.*—T. C. R. Higgins, C.M.G.  
*Wing Comdrs. to be Group Capt.*—A. Fletcher, C.M.G., C.B.E., M.C.; P. B. Joubert de la Ferte, C.M.G., D.S.O.; R. P. Mills, M.C., A.F.C.  
*Sqdn. Ldrs. to be Wing Comdrs.*—W. C. Hicks, A.F.C.; J. T. Babington, D.S.O.; E. M. Murray, D.S.O., M.C.; V. O. Rees, O.B.E.  
*Flt. Lts. to be Sqdn. Ldrs.*—J. C. Russell, D.S.O.; A. R. Arnold, D.S.C., D.F.C.; C. J. Mackay, M.C., D.F.C.; A. Gray, M.C.; R. H. Kershaw; R. Graham, D.S.O., D.S.C., D.F.C. and H. S. Powell, M.C.; C. F. Gordon, O.B.E., M.C., D.F.C.; E. B. Beauman; A. S. C. Maclaren, O.B.E., M.C., A.F.C. H. J. Payn, H. N. Bottomley, A.F.C.; L. C. Keeble; T. F. Hazell, D.S.O., M.C., D.F.C.; A. W. F. Glenn, M.C., D.F.C.; F. E. P. Barrington, H. G. Smart, D.F.C.; H. I. Hammer, D.F.C.

*Flying Offs. to be Flt. Lts.*—S. F. Vincent, A.F.C.; S. E. Adams; C. B. Riddle; H. V. Rowley; D. R. W. Thompson; L. G. Maxton; W. F. Dickson, D.S.O.; the Hon. J. H. B. Rodney, M.C.; I. M. Matheson; N. P. Dixon, A.F.C.; A. L. Chick, A.F.C.; E. R. C. Scholefield, D.C.M.; D. H. de Burgh, A.F.C.; A. J. G. Styran, M.C., A.F.C.; W. L. Fenwick; E. J. McLoughlin; S. Smith, D.C.M.; R. Ankers, D.C.M.; E. Thornton; G. H. Martingell; R. P. M. Whitham, M.C.; W. R. Curtis; F. Leathley, M.C.; W. K. Mercer; A. C. Sanderson, D.F.C.; M. Ballard; J. A. W. Binnie; R. Harrison, D.F.C.; P. M. McSwiny; E. G. Hilton, A.F.C.; H. S. P. Walmsley, M.C.; J. M. Mason, D.S.C., D.F.C.; E. R. B. Playford; H. L. Rough, D.F.C.; A. L. Fiddament; C. L. King, M.C., D.F.C.; N. H. Jenkins, D.F.C., D.S.M.; G. S. Oddie, D.F.C.; G. Martyn; D. V. Carnegie, A.F.C.; H. G. Crowe, M.C.; H. P. Lloyd, M.C., D.F.C.; H. G. W. Lock, D.F.C.; A. Bottoms; S. E. Mailer, A.F.C.; J. R. Cassidy; A. P. Ledger; O. G. Gregson; J. Duminy; R. F. Durrant, A.F.C.

## Stores Branch

*Flt. Lts. to be Sqdn. Ldrs.*—W. J. B. Curtis, O.B.E.; F. H. Songhurst, M.B.E.; C. Mason; W. F. Bryant; P. Adams, O.B.E.  
*Flying Offs. to be Flt. Lts.*—W. G. McD. Nicholl; K. D. G. Collier; J. L. Denman; J. R. Nicholls; J. K. McDonald; T. A. G. Hawley; F. N. Trinder.

## Stores Branch, Accountants

*Flt. Lts. to be Sqdn. Ldrs.*—W. H. Holroyd; H. J. Down; C. G. Murray, O.B.E.; P. J. Wiseman; T. H. Evans.  
*Flying Offs. to be Flt. Lts.*—R. Byrne, M.C.; J. S. Griffiths.

## Medical Service

*Wing Comdr. to be Group Capt.*—E. C. Stanford, D.S.O., M.B., B.Sc.

*Sqdn. Ldrs. to be Wing Comdrs.*—W. Tyrrell, D.S.O., M.C., M.B.; B. A. Playne, D.S.O., M.B., B.A.; H. A. Treadgold, M.D., B.A.; D. Ranken, M.S., B.S., F.R.C.S.

*Flt. Lts. to be Sqdn. Ldrs.*—E. P. Punch; J. H. Porter, M.C., M.B.; R. W. Ryan, M.B.; H. S. C. Starkey, O.B.E., M.D., M.A.

*Flt. Lts. to be Hon. Sqdn. Ldrs.*—H. B. Smith, M.B.; E. Brown; H. B. B. Greene.

## Chaplains' Branch

The Rev. H. McCalman, M.C., M.A., resigns his permanent commn.; July 1.

## Nursing Service

The following Staff Nurses are promoted to the rank of Sister (July 1):—Misses N. G. Rees, E. L. Whittingham.

## Memorandum

The commission granted to W. Cougle to retain the rank of Sec. Lt. is withdrawn on his joining the Army; June 19.

London Gazette, July 4, 1922

## General Duties Branch

H. W. R. Banting is granted a short service commn. as a Flying Offr., with effect from and seny. of June 22. Capt. A. J. Carlielle, R.A.S.C., is granted a temp. commn. as a Flying Offr. (Hon. Flt. Lt.) on seconding for four years' duty with the R.A.F.; May 9. Pilot Offr. F. V. Gauntlett to be Flying Offr.; May 29.

The following Pilot Offrs. on probation are confirmed in rank (May 28):—E. C. Barlow, C. A. Goatcher, R. C. Harrison, H. K. Waterfield.

Flying Offr. M. S. Marsden resigns his short service commn., and is granted the rank of Maj.; July 5. Flying Offr. A. G. Quinnell is placed on the Retd. List on account of ill-health; July 5. Flying Offr. W. Cole is placed on the Retd. List on account of ill-health contracted on active service, and is granted the rank of Capt.; July 5. Flt. Lt. P. J. Wiseman is granted a permanent commn.; April 1, 1920 (since promoted and transferred to the Stores Branch for Accountant duties). (Gazette, April 20, 1920, appointing him to short service commn. is cancelled.)

## Medical Service

The following are granted short service commns. in the ranks stated, with effect from and with seny. of June 21:—

*Flt. Lt.*—J. C. Osburne, M.B.

*Flying Offr.*—V. S. Ewing, M.B.

Flying Offr. T. A. G. Hudson, B.A., is granted a short service commn., retaining his present substantive rank and seny.; July 4.

## Memorandum

The permission granted to W. Sangster to retain his rank of Sec. Lt. is withdrawn on his joining the Army.

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

Air Commodore E. A. D. Masterman, C.M.G., C.B.E., A.F.C., from Headquarters, Coastal Area, to Half-pay List, on ceasing to be attached to Air Ministry (D.O.I.). 10.6.22.

*Wing Commanders.*—A. V. J. Richardson, O.B.E., M.B., D.P.H., from Headquarters, R.A.F. Middle East, to R.A.F. Depot (Inland Area). (Supernumerary.) 31.5.22. A. V. Bettington, C.M.G., from Half-pay List, to Command No. 12 Wing Headquarters (Ireland). 1.6.22. J. T. Cull, D.S.O., from Air Ministry (D.T.O.) to Headquarters (Coastal Area). (Supernumerary.) 17.7.22. H. R. Nicholl, O.B.E., from No. 7 Group Headquarters (Inland Area) to Air Ministry (D.T.O.). 3.7.22.

*Squadron Leaders.*—R. P. Wilcock, to School of Technical Training (Men) (Inland Area). 1.6.22. A. S. Morris, O.B.E., from No. 1 Flying Training School (Inland Area) to Headquarters (Inland Area). 22.6.22. H. E. Rowley, from Coastal Area Aircraft Depot (Coastal Area) to Headquarters, R.A.F. Cranwell. 15.6.22. C. S. Wynne-Eyton, D.S.O., from Headquarters, R.A.F. Ireland (Ireland), to command Irish Flight (Ireland). 1.5.22. W. W. Shorten F.R.C.S. (E.), from No. 1 School of Technical Training (Boys) (Halton) to R.A.F. Depot (Inland Area). (Supernumerary.) 6.6.22. A. J. Miley, O.B.E., from Air Ministry (D.G.S.R.) to No. 4 Flying Training School (Middle East). 29.4.22. A. Corbett-Wilson, from No. 1 Flying Training School (Inland Area) to Aircraft Depot, Egypt (Middle East). 29.4.22. W. J. Y. Guilfoyle, O.B.E., M.C., from No. 208 Squadron (Middle East) to command School of Photography (Inland Area). (Supernumerary.) 1.7.22. C. S. Wynne-Eyton, D.S.O., from Irish Flight (Ireland) to R.A.F. Depot (Inland Area). (Supernumerary.) 25.6.22.

*Flight Lieutenants.*—A. D. Pryor, from No. 100 Squadron (Inland Area) to No. 207 Squadron (Inland Area). 21.6.22. P. G. N. Ommanney, from Air Ministry (D.O.I.) to R.A.F. Depot (Inland Area). (Supernumerary.) 15.5.22. J. F. Roche, from Experimental Section, R.A.E. (Inland Area) to School of Army Co-operation (Inland Area). 3.7.22. D. Le Bas, from Central Flying School (Inland Area) to R.A.F. Depot (Inland Area). 17.6.22. H. E. Hayes, to Headquarters, R.A.F., Cranwell, on appointment to temporary Commission. 16.6.22. A. H. Wann, from Half-pay List to R.A.F. Depot (Inland Area). (Supernumerary.) 16.6.22. W. E. Hodgins, M.B., from Research Laboratory and Medical Officers' School of Instruction (Inland Area) to R.A.F. Depot (Inland Area). 19.6.22. P. T. Rutherford, O.B.E. (Medical), to Research Laboratory and Medical Officers' School of Instruction (Inland Area). On appointment to Short Service Commission. 8.6.22. T. L. P. Harries, M.B., from No. 1 Flying Training School (Inland Area) to Central Flying School (Inland Area). 15.6.22. F. G. Stammers, O.B.E., from School of Technical Training (Men) (Inland Area) to Headquarters (Inland Area). 18.6.22. A. C. Collier, from R.A.F. Depot (Inland Area) to No. 39 Squadron (Inland Area). 26.6.22. W. Sutherland, M.B.E., from C. and M. Party, Donibristle (Coastal Area) to Marine and Armament Experimental Establishment (Coastal Area). 16.6.22. D. O. Boddie, M.B., from

Stores Depot, Egypt (Middle East) to R.A.F., Trans-Jordan Headquarters (Middle East). 20.5.22. J. T. T. Forbes from No. 14 Squadron (Middle East) to No. 4 Flying Training School (Middle East). 27.5.22. W. D. Miller, M.B., from R.A.F. Depot (Inland Area) to Marine and Armament Experimental Establishment (Coastal Area). 15.6.22. W. H. Oakley, from Irish Stores and Repair Unit (Ireland) to Headquarters, R.A.F. (Ireland). 1.5.22. R. A. Young, from R.A.F. Depot (Inland Area) to No. 12 Wing Headquarters (Ireland). 3.6.22. J. A. Glen, D.S.C., from Canadian Air Board to R.A.F. Depot (Inland Area). (Supernumerary.) 27.5.22. H. C. Perkins (Medical), to Research Laboratory and Medical Officers' School of Instruction (Inland Area), on appointment to Temporary Commission. 6.6.22. R. H. Smyth, M.C. (Stores), from R.A.F. Depot (Inland Area) to No. 1 Stores Depot. 16.6.22. L. Game, to R.A.F. Cadet College (Cranwell), on appointment to Temporary Commission. 21.4.20. S. N. Cole, from Palestine Wing Headquarters (Middle East) to Headquarters, R.A.F., Iraq. (Supernumerary.) 14.5.22. W. A. C. Morgan, M.C., from Instrument Design Establishment (Inland Area) to R.A.F. Depot (Inland Area). (Supernumerary.) 17.7.22. C. H. Tancred, M.B.E., from R.A.F. Depot (Inland Area) to Inspector of Recruiting (Coastal Area). 13.7.22. N. R. Fuller, from R.A.F. Depot (Inland Area) to No. 1 Flying Training School (Inland Area). 1.7.22. A. J. Brown, D.S.O., from Research Laboratory and Medical Officers' School of Instruction (Coastal Area) to R.A.F. Central Hospital (Coastal Area). 26.6.22. H. C. Perkins, from Research Laboratory and Medical Officers' School of Instruction (Coastal Area) to R.A.F. Base, Gosport (Coastal Area). 26.6.22. J. C. Osborne, M.B., to Research Laboratory and Medical Officers' School of Instruction (Coastal Area). On appointment to Short Service Commission. 21.6.22. J. W. Woodhouse, D.S.O., M.C., from Central Flying School (Inland Area) to No. 1 Flying Training School (Inland Area). 1.7.22. A. Lees, from Central Flying School (Inland Area) to No. 1 Flying Training School (Inland Area). 1.7.22. J. K. Summers, M.C., from Central Flying School (Inland Area), to No. 5 Flying Training School (Inland Area). 1.7.22. B. McEntegart, from Central Flying School (Inland Area) to No. 2 Flying Training School (Inland Area). 1.7.22. J. J. Williamson, A.F.C., from Central Flying School (Inland Area) to No. 100 Squadron (Inland Area). 1.7.22. J. F. Gordon, D.F.C., from No. 207 Squadron (Inland Area) to School of Technical Training (Men) (Inland Area). 1.7.22. H. E. P. Wigglesworth, D.S.C., from R.A.F. Depot (Inland Area) to Irish Flight (Ireland). 26.6.22. P. T. Rutherford, O.B.E., from Research Laboratory and Medical Officers' School of Instruction (Coastal Area) to R.A.F. Hospital, Cranwell. 26.6.22. J. E. B. B. Maclean, D.S.C., from No. 267 Squadron, (Mediterranean) to No. 4 Flying Training School (Middle East). (Supernumerary.) 10.6.22. W. H. De W. Waller, A.F.C., from No. 100 Squadron (Inland Area) to Palestine Wing Headquarters (Middle East). (Supernumerary.) 15.6.22. A. R. T. Pison, D.S.C., from H.M.S. "Pegasus" (Mediterranean) to Headquarters, R.A.F. (Mediterranean). (Supernumerary.) 10.5.22. E. D. Davis, from No. 267 Squadron (Mediterranean) to H.M.S. "Pegasus" (Mediterranean). 7.6.22.

## Siddeley "Jaguar" Passes New Type-Tests

THE 14-cylinder Armstrong-Siddeley "Jaguar" radial air-cooled engine has recently passed the new Air Ministry type-tests, which include five non-stop runs of 10 hours each, the first half hour of each period being run at full throttle, and the remaining 9½ hours at 90 per cent. of full power. At the end of each period a five-minute run at full power

was given. We had the opportunity of seeing the engine dismantled after the tests, and it appeared to be in perfect condition, no appreciable wear being noticeable anywhere. The fuel and oil consumption were very low, and the engine should be very useful when the R.A.F. comes to be equipped with new flying stock. The 14 cylinders give very even torque and smooth running generally.

## TITANINE ACTIVITIES

DURING the period of lethargy through which the aircraft industry has been passing, it is interesting and pleasurable to be able to record that Messrs. Titanine, Ltd., have continued to actively engage themselves in experiments in connection with dopes and finishing materials.

This firm has always "stuck to its guns" on the question of the durability of "Titanine"—the well-known nitro dope manufactured by their special patented formulæ—as against the usual cellulose acetate dope, and from the commencement of the dope industry being an industry have emphasised the necessity of proper protective coverings. They have also urged the careful study of two important dope problems, *i.e.*, the elimination of ingredients injurious to the workers' health and the effective resistance of the coverings to danger from fire. It is gratifying to note that Air Ministry specifications now embody clauses providing for these points. Messrs. Titanine not being in business entirely for their health's sake, have been compelled to manufacture dopes on the actyl-cellulose basis, and have received a good share of what business has been done in this direction. They nevertheless recommend all their customers to employ the standard Titanine doping materials in preference to acetate whenever specifications, or the absence thereof, permit.

A very good testimony to the Company's materials is their success with their "Racing Scheme," the famous "Bamel" or "Mars I," the holder of the British speed record, being coated with the "Titanine Racing Scheme" prior to its greatly increased speed. Also, as regards durability, an Avro machine owned by the Berkshire Aviation Co. which had been touring Great Britain for over a year, had only been in a hangar on five occasions; the rest of the time the machine had been anchored in fields where the whole of the flying surface had been exposed to the elements. During the winter of 1920 nothing was thought of scraping one to three inches of snow off the wings before commencing the day's flying. The machine in question carried 5,854 passengers, and flew, roughly, 19,000 miles. This is surely conclusive testimony to the excellence of "Titanine," with which this machine was doped.

When the "Mars I" made a forced landing in France, Mr. Folland, the designer, wrote to Messrs. Titanine that:—

"Owing to careless handling, and due to the local help putting their feet through the wings, it necessitated repairs over an area of the wings to approximately 6 to 8 sq. ft. As we had no facilities for doping we had to make the best of a bad job. The new piece of fabric was doped on the wing in a shed where the temperature was below freezing-point. As we had to make a hurried repair, three coats of dope were applied in less than ten hours. The new portion, when dry, was as tight as the original dope. The temperature and the putting on of the coats of dope in so short a time did not appear to affect the excellent tightening of the dope; the result was perfectly good, and I think it speaks volumes for the quality of your dope."

It is also interesting to note that the "Avro Baby" seaplane that was taken out with the Rowlett Quest Expedition had its flying surfaces coated with Titanine dope and protective covering.

As to other activities, Messrs. Titanine's works are also now employed, we understand with considerable success, on other products not concerned with the aircraft trade. For instance, one of their latest departures is "Otello" paints, which have the novel feature of being oilless, leadless, very fast in drying, resist acid and electrolysis and may be applied even over bituminous paints without the latter penetrating. The last quality and that of being oilless must surely be unique. A paint on a somewhat similar basis is their "Lumilac" for wood and metal seaplane floats, hulls of flying boats, metal and ply-wood wings, etc. etc. This paint has the special and unique feature of being absolutely waterproof. Also, it adheres to bright aluminium surfaces—an unusual feature in paints.

We do not think that manufacturers or designers of aircraft quite realise that dope and fabric coverings play as important a part in the speed of aeroplanes as they do. The problem is somewhat analogous to the painting of ships' hulls, when by the use of certain paints or compositions it has been found that an extra knot or so can easily be obtained through giving the bottom a paint surface that reduces friction to a minimum. Messrs. Titanine have often expressed their readiness to assist designers or those interested, by research work on special dope coverings, to meet any particular requirement. We believe that they have a very efficient and highly trained technical staff well competent to carry this out.

## THE LONDON AERO-MODELS ASSOCIATION (The Society of Model Aeronautical Engineers.)

At the Committee Meeting held at Headquarters, 20, Great Windmill Street, Piccadilly Circus, W. 1, on Thursday, the 6th inst., it was resolved that the title "The Society of Model Aeronautical Engineers" should be registered forthwith.

On Saturday, the 8th inst., members who had entered for the Flight Golf Competition assembled on Wimbledon Common, but, unfortunately, the weather conditions were so bad that it was necessary to postpone the competition to Saturday, July 22, at the same time and place. It was very gratifying to see so many enthusiastic members turn up under such conditions.

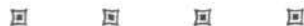
Meetings are held every Thursday at Headquarters, 20, Great Windmill Street, Piccadilly, W. 1, at 7.30 p.m.

Report from Research Committee re Propeller Testing Apparatus

The speed of the motor without propeller is found to be 2,700 r.p.m. A suggestion to gear the motor down in the ratio 2 to 1 is being carried out, and it is anticipated that a speed between 1,000 and 1,200 r.p.m. will be obtained with propellers from 8 to 12 ins. diameter. Further information on this point may be available next week.

W. E. Evans, Hon. Sec. (*pro tem.*), Research Committee.

Hon. Sec., A. E. Jones, 48, Narcissus Road, West Hampstead, N.W. 6, to whom all enquiries and communications should be addressed.



## Royal Air Force Memorial Fund

A MEETING of the Executive Committee of the Fund was held on June 21.

Grants to the amount of £453 12s. 1d. were approved.

The matter of the War Memorial, now in course of erection on the Thames Embankment, was considered in detail. It was hoped that the monument would be ready for unveiling by November 11 (Armistice Day), but, owing to unlooked for delays, it is probable that the ceremony must be postponed till, at earliest, January next.

The names of Air Vice-Marshal Sir Geoffrey Salmond and Group Captain E. R. Ludlow-Hewitt, both of whom have been nominated as members of the Executive Committee of the Fund, were added to the War Memorial Sub-Committee, which will deal with the details of the unveiling of the War Memorial.

The name of Air Vice-Marshal Sir John Salmond, lately embarked for India and Mesopotamia, was added to the list of Vice-Presidents of the Fund.

With regard to the Vanbrugh Castle School, the Acting-Chairman of the Sub-Committee, Mr. W. S. Field, referred to the fact of the erection of an emergency staircase in compliance with L.C.C. rules as regards fire escapes, and mentioned that half the cost of this structural alteration was being most generously borne by the donor of the house, Mr. Alexander Duckham. Mr. Field himself is generously contributing £50, and one or two other donations have been earmarked for this purpose. A balance remaining of £100, has been sanctioned by the Executive Committee from the General Fund.

## FLIGHT

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